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### SINGAPORE AND AFTER: A BRIEF HISTORICAL SURVEY OF THE ACTIVITIES OF THE AUSTRALIAN ARMY MEDICAL CORPS IN MALAYA.<sup>1</sup>

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A WORD of explanation is indicated before this symposium is presented to the members of the Victorian Branch of the British Medical Association.

The experiences, medical and otherwise, of prisoners of war in Malaya have been described in the lay Press and have in part been presented to this Branch by Lieutenant-Colonel A. E. Coates, Lieutenant-Colonel E. E. Dunlop and Major A. T. H. Marsden. We feel that the public, and to some extent our own colleagues, are a little weary of a subject which has ceased to be "news". Particularly have those colleagues a cause for weariness who themselves have laboured for long years in the heat of battle which ended in final victory, and of whose work little mention has been made except in scientific articles published in THE MEDICAL JOURNAL OF AUSTRALIA. Exceptions are provided by the excellent addresses given by Brigadier F. Kingsley Norris, one in February, 1945, on the New Guinea campaign, and one earlier on the Syrian campaign. The remedy is not that reports on the Malayan theatre should be suppressed, but that reports on other theatres should be encouraged, in accordance with Brigadier Norris's example.

A meeting such as this is hardly the place to discuss detailed problems of Army Medical Corps organization, or tactics, or even the lessons learnt from their application.

<sup>1</sup> Read at a meeting of the Victorian Branch of the British Medical Association on May 1, 1946.

<sup>2</sup> Colonel Derham was formerly A.D.M.S. of the Eighth Australian Division, Australian Imperial Force, Malaya.—EDITOR.

These subjects will be dealt with more fittingly in the medical history of the war, at the United Services Institution, and during tactical exercises of the future. Tonight it is proposed to give a brief outline of the dispositions and movements of the Australian Army Medical Corps in Malaya and of the major problems which confronted us before, during and after the campaign.

On February 18, 1941, there arrived in Malaya by the *Queen Mary* a brigade group of all arms, with the following medical units attached: the 2nd/9th Field Ambulance, the 2nd/5th Field Hygiene Section, the 2nd/4th Casualty Clearing Station, the 2nd Australian Mobile Bacteriological Laboratory, one section of a motor ambulance convoy without medical wing, the 2nd/10th Australian General Hospital (400 beds, increased in June, 1941, to 600 beds), a detachment of an advanced depot of medical stores, and certain dental units. This force was met on arrival by members of the staff of the Eighth Division, who had preceded it by air, and Major (now Lieutenant-Colonel) J. Glyn White was in charge of the medical arrangements. Their disposition in Malaya was based not on strategic considerations, but on the accommodation available in areas fully controlled against malaria. Thus divisional headquarters and attached units were at Kuala Lumpur, the casualty clearing station and motor ambulance convoy at Kajang, fifteen miles to the south, the infantry brigade and field ambulance in the Seremban-Port Dickson area, and the artillery regiment and 2nd/10th Australian General Hospital in Malacca.

The siting of our general hospital at Malacca was decided on by Malaya Command before our arrival; the decision proved unfortunate for several reasons, which could hardly have been foreseen, but which will be clear from what follows. The hospital occupied excellent buildings, part of a modern civil hospital; but the port of Malacca was unsuited for evacuation by sea, as ocean-going ships had to stand several miles off shore. The dangers of the

position were realized early in training days, and detailed plans were made for rapid dispersal or a move under pressure.

At this time the strategic role of the Australian Imperial Force, in the event of hostilities, was to be a mobile army reserve to Malaya Command.

Gradually the Australian Imperial Force headquarters staff was built up to full divisional strength, and in July it was announced that an additional Australian Imperial Force brigade group was to arrive in August. Our medical units had already been reinforced by the arrival of the 2nd Australian Convalescent Depot and a motor ambulance convoy in April. This increase involved the provision of more general hospital accommodation, which was asked for in July. The 2nd/13th Australian General Hospital arrived in September. The promptness with which this request was met was typical of the support which the Director General of Medical Services office at Army Headquarters, Melbourne, gave us throughout the whole period in Malaya. Our smallest and our greatest needs were supplied with all possible speed. The one exception was the fact that no hospital ship arrived for the evacuation of Australian casualties from Singapore after the commencement of hostilities. That is another and sadder story, which may never be fully told. One hundred and eighteen sick were sent away on the *Orion* on December 31, 1941, and 127 sick and wounded on the *Wah Sui* on February 10, 1942; the latter was a small coastal vessel fitted as an inter-port hospital ship by the Deputy Director of Medical Services, Malaya Command.

On August 15, 1941, the 27th Brigade Group arrived with the 2nd/10th Field Ambulance attached, and four additional dental units. As the Australian Imperial Force was a self-contained force, it represented in effect a vertical section of an army corps. By September it was realized that it would be impossible for the divisional staff to control all base units as well as the field troops in the event of hostilities. An administrative headquarters was formed for this purpose. Major Glyn White went as lieutenant-colonel to be medical director of the base organization, and was replaced by Major Bruce Anderson as Deputy Assistant Director on the divisional staff. This division of responsibilities was not without its difficulties; but Colonel White and I had worked together for so long that it made very little difference.

In July it had been decided to change the strategic role of the Australian Imperial Force from that of a mobile reserve to that of a fixed defence force in defence of the area comprising Johore and Malacca. The reason for this decision would be hard to explain, except that Mersing was considered the key to Singapore, and in fact the Japanese, during the campaign, had a large force in ships ready to land there if necessary. The accommodation of the troops changed from permanent buildings to hutted and tented camps in what were called semi-deployment areas. The point of expected attack was Mersing, a fishing village on the east coast of Johore, 84 miles north-east of Johore-Bahru. At the end of August the 22nd Australian Brigade took up a defensive position at Mersing and spent the next three months digging in. The 2nd/9th Field Ambulance constructed in this area an advanced dressing station capable of holding 600 stretcher cases for a period of upwards of a week. All patients were to be accommodated in blast-proof recesses, and there were a large underground dressing station and operating room proof against anything less than a direct hit. This work, together with the construction of half a mile of road, was carried out entirely by medical personnel under the technical guidance of the field engineers. This, in addition to the performance of their normal duties of caring for the sick and injured, was no mean feat, and the officer whose drive and initiative made it possible is here tonight in the person of Lieutenant-Colonel Hedley Summons.

It is easy to be wise after the event; but few of us believed that the fortifications at Mersing would ever be used for the purpose intended for them. As it turned out, they were not—but for a reason that none of us anticipated. Few, if any, dreamed that the Japanese could

advance nearly 450 miles from Singora to the Straits of Johore in less than two months.

This in fact is what they did. They landed at Singora and Patani on the east coast of Thailand early in the morning of Monday, December 8, and early in January, 1942, the situation of the 11th Indian Division on the northern front was so serious that our 2nd/10th Australian General Hospital in Malacca seemed to be virtually in the front line. It was moved hurriedly by stages to a new site on the island near the city of Singapore. The 9th Indian Division was forced to withdraw from the east coast at Kuantan and Kota Bahru to avoid having its line of communications cut by the rapid withdrawal of the 11th Indian Division.

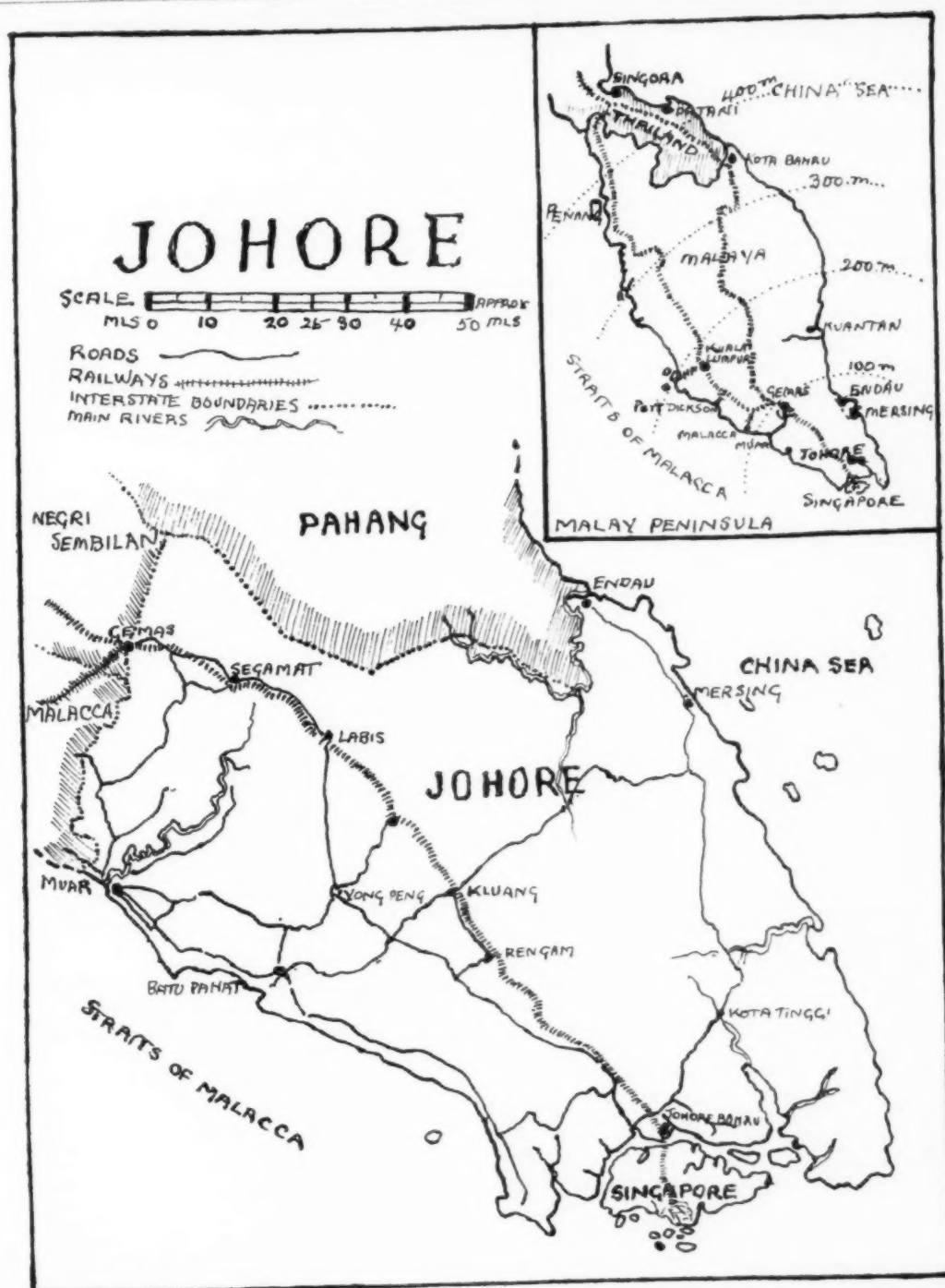
On January 10 a defensive line was taken up at Segamat, 116 miles north of Johore Bahru, under the command of the General Officer Commanding the Australian Imperial Force in Malaya. The forces under his command consisted of the 27th Brigade Group, Australian Imperial Force, with the 2nd/10th Field Ambulance under brigade operational control, the remains of the 9th Indian Division, the newly arrived and only partly trained 45th Indian Brigade (stationed on the left flank at Muar), and later a brigade of the newly arrived 18th (British) Division, and certain other units which changed from time to time. This force constituted what was in effect a mixed but very weak army corps, and was known as "West Force". We waited on the Segamat line until the shattered 11th Indian Division moved through to the rear. The Assistant Director of Medical Services, 8th Australian Division, took over from the Deputy Director of Medical Services, 3rd Indian Corps, and on January 14 the 2nd/30th Battalion, Australian Imperial Force, which had been pushed forward beyond Gemas, about 20 miles north of Segamat, took and repulsed with heavy loss the first enemy attack. The enemy losses were so heavy and the Australian morale was so high that the tide of the advance might have been stemmed and even driven back had the enemy been willing to play the game according to our rules. This, of course, he never did. By January 16 he was attacking the 45th Indian Brigade at Muar, 50 miles behind the Australian left flank. This brigade was wiped out within a few days, in spite of the heroic efforts to save the situation of our 2nd/29th Battalion and later of our 2nd/19th Battalion. The 2nd/19th Battalion had been hurriedly withdrawn from the Mersing front to be thrown into this forlorn hope. The medical officers of the 2nd/30th and 2nd/29th Battalions, Captain John Taylor and Captain Victor Brand respectively, were awarded the Military Cross for their gallantry in these actions.

And so the whole force was obliged to withdraw, under constant enemy threats from the left flank and later from the right. Landings at Endau, north of Mersing, and infiltration down the coast from Kuantan threatened the 22nd Brigade at Mersing. The 22nd Brigade could with ease have dealt with the enemy in that area, but it was forced to withdraw in sympathy with the withdrawal of the main body down the main road and railway line from the north. This it did with great skill, inflicting heavy losses on the enemy who attempted to follow up.

During this short campaign the key to the Australian Imperial Force medical dispositions was the 2nd/4th Casualty Clearing Station at Kluang. It was so placed that it could receive casualties from the north at Segamat, from the east at Mersing, and from the west at Muar and Batu Pahat. It evacuated casualties to the 2nd/13th Australian General Hospital at Johore Bahru both by road and by ambulance train. Most of the casualties from the Mersing area were sent to the same hospital through the main dressing station of the 2nd/9th Field Ambulance at Kota Tinggi.

The siting of the 2nd/4th Casualty Clearing Station at Kluang is worthy of comment. In the original battle plan for the defence of Johore it was proposed to place it at Segamat, a malaria-controlled area, because of its easy access by road and rail to Malacca.

Brigadier C. H. Stringer, Deputy Director of Medical Services, Malaya Command, pointed out that it was by no means so certain as our general staff envisaged that we



would be fighting an enemy coming from the east. He pointed out the advantages of Kluang, which I have already mentioned, and our decision was immediately changed. While it remained at Kluang the 2nd/4th Casualty Clearing Station received casualties from east, north and west, and thus was vindicated a truly prophetic vision by a great medical leader with whom we worked in the closest har-

mony and cooperation from the day Lieutenant-Colonel Glyn White landed in Singapore in early 1941 until I said good-bye to him in Calcutta in September, 1945.

During the battle of Gemas the average time taken for a patient to be brought from the front line to the casualty clearing station at Kluang was six hours; the distance was nearly 90 miles, over a narrow, winding road, crowded



with army transport. The casualty clearing station remained at Kluang until January 19, when the heavy section moved thirty miles to the rear, leaving the light section to support the 2nd/10th Field Ambulance; this unit moved into Kluang on January 20, when the enemy was only a few miles away to the north and to the west, and the Westforce Headquarters at Rengam 14 miles to the south.

Owing to the rapid withdrawal and the confused situation, medical units were left in their successive positions until the last possible minute. On more than one occasion mobile advanced dressing stations moved back with the rearguard of the retreating infantry. This policy was deliberate, as it was the only effective way to evacuate the last of the wounded. It was impossible, otherwise, for motor ambulances to locate the rapidly moving regimental aid posts. The sub-units of the field ambulances and the light section of the casualty clearing station had been trained to be self-contained and completely mobile; the latter had to use transport begged, borrowed or commandeered. To each were attached enough motor ambulances to lift all likely casualties. These were constantly replaced by the "relay post" system. Motor ambulance convoy vehicles were frequently used in front of the main dressing station of the field ambulance. The casualties among Australian Imperial Force medical personnel, patients and vehicles on the mainland were almost negligible, apart from those involved in the debacle at Muar. We were lucky.

Thus this story of successive withdrawals went on until the night of January 30, when the last of the British and Australian forces crossed over the causeway to Singapore Island.

In the meantime it had been necessary to move the 2nd/13th Australian General Hospital, with its 1,200 patients and beds and all equipment, from Tampoi Hill at Johore Bahru to St. Patrick's School on the south side of Singapore Island, 25 miles away. To cover the move of the 2nd/10th Australian General Hospital from Malacca, early in January the 2nd/13th Australian General Hospital had been expanded from 600 to 1,200 beds almost overnight, and when it became obvious that the mainland was to be evacuated, the move of our only fully functioning hospital presented a problem indeed. Fortunately, by January 24 the 2nd/10th Australian General Hospital was fully staffed in its new site, and by January 26 it was able to accommodate 538 patients. The move of the 2nd/13th Australian General Hospital commenced on the afternoon of January 24 and was completed by 4 a.m. on January 26.

Lieutenant-Colonel Nicholls, in his book on the army medical services in the field, gives the normal time for the moving of a general hospital ready to function as six weeks. The 2nd/13th Australian General Hospital moved, with patients and equipment, and reopened in thirty-eight hours. The late Colonel D. C. Pigdon in his diary gives full credit to Lieutenant-Colonel Glyn White and his assistant, Captain F. R. Vincent, for this achievement. He refers to the movement as a "miracle", as indeed it was; but it was not the only miracle to Colonel White's credit.

The story of the fighting on the island would require another evening to describe, even briefly. Let it suffice to say that the Japanese crossed the straits and attacked on the night of February 8. By Sunday, February 15, the Australian Imperial Force had withdrawn into a small racket-shaped perimeter surrounding the Tanglin Barracks in the outskirts of Singapore and only three miles from the sea. The Australian Imperial Force fighting troops in this perimeter were served by an improvised field hospital with accommodation for about fifty stretchers and staffed by the field ambulances.

The 2nd/13th Australian General Hospital and the 2nd/4th Casualty Clearing Station had been left outside our retreating lines on the east flank, and all other medical units were crowded into various buildings in the heart of Singapore city. Many of the patients and staff of the British General Hospital at Alexandra on the west flank had been massacred by the enemy as they drove through behind the retreating 44th Indian Brigade. Our Aus-

tralian army nurses had been sent away on February 10, 11 and 12, and this led to a feeling of depression among both patients and staff of the hospitals. Civilian casualties had been very heavy, water supply had practically failed in all the hospitals, civil and military, and sanitation was non-existent. Nearly all our medical units had been under bomb, shell, mortar and even machine-gun fire. At 8.30 p.m. hostilities ceased.

Singapore had fallen.

Immediately after the capitulation, the two most urgent problems that faced the medical services were, firstly, the accommodation and care of the sick and wounded, and secondly, the need for making contact with the International Red Cross before we were finally shut off from the outside world. Lieutenant-Colonel Glyn White was given the task of moving all medical units, Australian, British and Indian, with their patients and equipment, to their prison camps at Selarang, Changi and Bidi Darri respectively. We arranged for the appointment of a Red Cross representative to replace the acting commissioner, who was a patient in the 2nd/13th Australian General Hospital outside the Japanese cordon. This officer's credentials were accepted by the Japanese, he was given a motor-car and a pass, and made contact with the (Swiss) representative in Singapore of the International Red Cross.

The next immediate problem was the conservation of our limited supplies of medical equipment, drugs and dressings, under the threat that these would be confiscated by the enemy. Most of the "Atebrin" and quinine was distributed in small parcels among officers and men, so that no one had very much, and no one person knew where it all was, in case of search. This proved a wise measure, as the Japanese did confiscate a considerable proportion of these drugs if they found them, and it also insured that parties moving out of camps or overseas had at least an emergency supply to begin with.

One method of hiding "Atebrin" is worthy of record. The "Atebrin" for issue to forward troops was contained in screw-top cylinders of black plastic material. Most of the buildings in which we were quartered in Changi had white plaster walls and black hardwood picture rails. The "Atebrin" cylinders were laid end to end on the picture rails in full view of the inspecting Japanese, but were never noticed, and some of them continued to serve as an emergency supply until August, 1945.

The battle casualties of the 8th Australian Division and attached troops were as follows: killed in action, 1,013; died of wounds (before the capitulation), 112; died of wounds (battle casualties, after the capitulation), 23; wounded in action, 1,201. Of approximately 20,000 Australians who were prisoners in Japanese hands, 5,432 died of disease or injury while in captivity.

In conclusion, and before I hand the narrative on to my colleagues, it is fitting that I should pay a well-deserved tribute to the work of all ranks of the Australian Army Medical Corps in Malaya. At the time of the capitulation all medical units were unbroken and almost unshaken, and were fit and willing to carry on their normal duties. This in actual fact they continued to do until they were released in August, 1945. Their work was typical of all other Australian Imperial Force services in Malaya, including the Red Cross and other auxiliary services.

During the campaign, as in all other Australian Imperial Force theatres of operations, the officers and other ranks of the Australian Army Medical Corps did not fail. The regimental medical officers were outstanding. None fell short of the highest standard in any way at any time. The same is true of all commanding officers and officers and most other ranks of medical units. The work of individuals and units will be recorded in history; but that time is not yet, and I feel it my duty to place the broad facts on record here and now. The work and conduct of the members of the Australian Army Nursing Service in Malaya were so magnificent at all times that I can hardly trust myself to speak of them. Their supreme courage and devotion were never more inspiring than when our hospitals came under heavy fire. It was then that they set an example of calmness and courage to many a shaken



soldier, which brought tears of pride and admiration to the eyes of their male colleagues, including myself. The fate of some of them, who were evacuated too late, is the blackest page in all the black tragedy of Malaya. Their memory will always be the most sacred trust of those for whom they so gladly risked their lives.

#### ADMINISTRATIVE AND CLINICAL PROBLEMS IN AUSTRALIAN AND BRITISH PRISONER-OF-WAR CAMPS IN SINGAPORE, 1942 TO 1945.<sup>1</sup>

By J. GLYN WHITE, O.B.E., M.B., B.S.

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WHEN the British forces at Singapore capitulated and were herded by their captors into various prisoner-of-war camps, a great responsibility was thrown on the medical services, whose main object still was the prevention of disease and the keeping of troops alive, so as to enable as many as possible to return to their homelands. It was realized that when they returned they would not be 100% fit, but it was hoped that they would be in such a state of health as would allow them to improve rapidly when given adequate food and medical attention. This was the only way of doing the greatest good for the greatest number, and it was soon realized that if all our resources were not pooled for the common good, some would have a better chance of survival than others; it was indeed thrilling to see the way in which everyone responded to the call for hard work and self-sacrifice.

The main administrative problems which arose were a direct result of the nature of our captors, who were entirely lacking in even the crudest elements of what we call civilization, who considered themselves superior to us in every way, and who never missed an opportunity of stressing this. These characteristics, combined with an entire lack of regard for human life and their inhuman attitude towards sick and wounded, caused our period in captivity to be one of continual apprehension, a battle of wits and a never-ending fight against disease, the type of which most of us had not experienced before and do not wish to experience again.

Perhaps a description of my first interview with Japanese staff officers will give you a fairly clear picture of the type of individual with whom we had to deal. I do not say this with any bitterness towards them—I feel sorry for them—and the more I had to deal with them, the more thankful I was that I had been born British and not Japanese. On the morning of February 17, 1942, I reported to Brigadier C. H. Stringer, D.S.O., O.B.E., who was Deputy Director of Medical Services, Malaya Command, and found him in conference with a Japanese medical staff officer, who was busy demanding, in a menacing way, an accurate figure of the sick and wounded amongst the British forces and their exact location on the island. While waiting for this information he was busily engaged in mopping his brow, picking his teeth and spitting on the floor. When given the information he issued orders that the 9,000 odd sick and wounded, together with a minimum quantity of medical equipment, were to be moved a distance of some twenty miles to the prisoner-of-war concentration areas, and for this move, which was to be completed in seven days, he generously allowed five motor ambulance cars. Brigadier Stringer, in fearless fashion, protested vigorously and did not fail to show this Japanese medical officer just what he thought of such inhuman treatment. But it was of no avail, for this Japanese lieutenant-colonel replied: "This is an order of the Imperial Japanese Army and is to be obeyed—most of your sick and wounded will march the distance." He then gave instruction that no field medical equipment was to be taken; it was to be handed over to the Japanese forces.

Fortunately for us (in some ways) the Japanese organization for prisoners of war was not perfect. It appeared that the Japanese had not expected to capture Singapore so quickly, and it took a considerable time for their base troops to arrive in Singapore; moreover, although their medical directorate issued many orders, in those early days they had not the necessary guards to enforce the orders, so it was not surprising to find that the transport for the sick and wounded increased from five ambulances to 55 ambulances, 20 three-ton motor lorries and a staff car, and the time of seven days gradually increased to three weeks. In that time, and with the increased transport, a goodly quantity of medical stores and equipment was taken into the prisoner-of-war camps, some of which was still being used in August, 1945.

Lack of information from the Japanese, and the secrecy maintained by them regarding the moves of various working parties from the camp and the arrival of new parties from other prisoner-of-war camps, greatly increased our administrative difficulties and made it well nigh impossible to maintain any detailed plan of action. After a great deal of work in deciding the rate of expenditure of drugs and how much of our reserve food stores we could allow for therapeutic and prophylactic purposes, the movement of working parties from the camp or the arrival of parties with a high percentage of sick would throw everything into the melting pot again; and so it went on for the whole period of our captivity. It was common suddenly to receive information from the Japanese that a party of 1,000 would be arriving in two hours, 450 of whom were sick, and when the Japanese admitted that a man was sick, he was always desperately ill. This would mean that extra hospital accommodation would have to be quickly found, and many a man returned from a local daily working party at night to find that his place had been taken for a patient.

Perhaps I should explain about the "reserve" food I have mentioned, as some of you will be naturally wondering how we had any. I may say that it was not a "reserve" in the ordinary sense, as at no time did we have anything like adequate quantities of food. In September, 1942, the Japanese commenced to pay the officers and Red Cross personnel and the troops who were fit to work, and as some food was available from Chinese merchants in Singapore through the local Japanese commander (who received his commission on all stocks purchased), most of the pay received was contributed to the establishment of what was known as a camp messing fund. With this fund were purchased commodities such as soya bean, pigeon pea, dried whitebait, dried fish and red palm oil, and each day all prisoners were issued with some of these commodities to try to prevent epidemics of deficiency disease, particular stress being laid on the prevention of beriberi, as this disease, as you all know, will rapidly cause many deaths. Month by month we tried to build up our reserve stocks, and we always strove to have a six months' reserve on hand. With the arrival of one shipment of Red Cross supplies late in 1942, and with what our local Red Cross representative could obtain for us before prices jumped to inflation level, by the end of 1943 we had a six months' reserve, provided that the Japanese did not cut our ration scale. In maintaining this reserve we had to take the risk of having to jettison it if we were at any time suddenly moved, and also the risk of its being taken from us by the Japanese. Fortunately neither of these happened, and the camp messing fund commodities prevented many deaths which otherwise would have occurred.

Perhaps a few observations about deficiency disease, in general, and the method by which the rate of expenditure of our "reserve" food was determined, may be of interest. As you all know, a satisfactory diet contains carbohydrate, protein, fat, inorganic salts, vitamins *et cetera*, and the various components must be balanced, especially in regard to the ratio between thiamin (calculated in microgrammes) and the Calories produced from carbohydrate and protein. This ratio must be maintained above the level of 0.3 if beriberi is to be prevented. The other deficiency diseases produced by the lack of protein, riboflavin, nicotinic acid *et cetera*, although causing a high morbidity, were not

<sup>1</sup> Read at a meeting of the Victorian Branch of the British Medical Association on May 1, 1946.

associated with the high mortality rate which characterized beriberi.

Now, as the quantity of food supplied by the Japanese varied from week to week, it was necessary to calculate the quantity of each component of the diet at weekly intervals and then, always having in mind the necessity for strict economy in the use of our reserve food, to add to the Japanese scale a calculated quantity of each commodity available so as to try to maintain the thiamin-fat caloric ratio as near as possible to the 0.3 level. Then, by trial and error, if practicable, the other components of the ration scale were increased. Special diets were also calculated for various types of hospital patients. This meant a great deal of tedious work, not only on the part of the medical staff, but also on the part of the personnel of the quartermaster's staff, who distributed the food to the various kitchen units; they in turn, with many difficulties, such as the lack of fuel, unsuitable cooking utensils *et cetera*, did their utmost to serve the food in as palatable a way as possible, and many of them became quite expert at it.

With regard to medical supplies, here again we tried to maintain a six months' supply; month by month the position was reviewed and expenditure was cut down. Apart from quinine, the medical supplies from Japanese sources were almost negligible; for example, a one-pound roll of cotton wool would be expected to last a hospital of 2,500 beds for one month. It was not surprising, therefore, that many essential items were simply not available, and medical officers had to do all in their power to keep the patient alive, with little hope of curing him while such conditions lasted. We managed to grow our own castor-oil beans and extract the oil; stramonium plants and derris root were also cultivated, and we were fortunate enough to find a seam of white clay near the camp, out of which was produced an alkaline mixture. From time to time some medical supplies were found by parties working on the wharves in Singapore; in this way useful items, such as glycerin, mercury, sulphur *et cetera*, found their way into our medical stores. One could always rely on the members of such working parties assisting the hospital in every possible way. One Japanese officer in charge of one of these parties decided that the Australians were thieves, and told them so. He then proceeded to demonstrate the method by which the stealing took place. He placed a tin of condensed milk on a table and borrowed an Australian slouch hat, put it on his head, and then proceeded to the table where the tin of milk stood. As he approached the table he looked around to see that no one was looking, and quickly doffed the hat and placed it over the top of the milk tin. He wandered casually onwards as if nothing had happened, then retraced his steps to the table, expecting to pick up the hat and tin together and place them on his head; but when he came to do it, the tin of milk was no longer there—in the few seconds his back had been turned the milk had been deftly removed. With such personnel you can realize that no opportunity of bringing in much-needed medical supplies was ever missed.

One continual source of annoyance from an administrative point of view was the lack of cooperation between the Japanese general staff and their medical directorate; either side passed the responsibility to the other, even over what would appear to us to be trifling matters. For example, if we wanted to oil some fish ponds in the vicinity of the camp which were breeding mosquitoes, or if we wanted simply to collect grass for the vitamin extract centre, the proposal would have to be submitted in writing to the Japanese medical directorate, who in turn would submit it to the local commander; then, after a delay of days, one would have to ask again and again and probably be refused, and then at a later date bring the matter up again. Then one side might grant permission, and so the men would sally forth, only to be turned back by a guard who had not been informed that permission had been granted. Thus the majority of one's time and energy as an administrative officer was taken up by such needless pinpricks. Of course at times we did not ask for permission to do certain things; if we were not detected, all went well; if we were, then a long series of explana-

tions would have to be made and apologies tendered, and for the next little while one would have to tread somewhat warily. To try to protect the men, risks had to be taken; for instance, the Japanese were given a fitness return at the end of every week; by not being truthful, this return showed approximately 25% above the true figure as not fit for any work, and this procedure went on undetected for some time. In this way it was possible to give some of the workers a day off a week; but the local commander, on moving through the camp, noticed several men whom he considered fit to work, and instructed his own medical officer to carry out an inspection. Naturally we were somewhat apprehensive as to the outcome of this inspection, which was to take three days, and on the first day we presented the worst 1,500 in the camp and all went well. At the end of the first day, the Japanese medical officer kindly informed us that another medical officer would be coming the next day, so he saw the same 1,500. It was therefore not surprising that the results of the Japanese inspection finally tallied with our figures. But later on they made everyone work who was not, according to their standards, ill enough to be in hospital.

Jealousy between local Japanese camp commanders often prevented the main camp from sending much-needed medical supplies to detachments of prisoners of war on other parts of the island, and although definite orders were issued on the subject, these supplies were nearly always smuggled through by the bravery of countless troops who would risk anything for a sick comrade and voluntarily do all they could to help him. This was particularly noticeable in the treatment of patients suffering from chronic diseases, such as pulmonary tuberculosis; never once was there any complaint about the extra food being given to such sufferers, even when towards the end of 1944 food became very scarce. The plight of these sufferers caused us great concern, and we often wondered whether we were justified in trying to keep such patients alive.

Perhaps the most trying time I experienced on the administrative side was at the end, in the period after the Japanese capitulated, but before our own troops and stores arrived. At the commencement of this period the Japanese released a large quantity of polished rice; but I could not recommend its issue to any great extent, as it would have rapidly caused an epidemic of beriberi. However, the troops were hungry and would have eaten anything, and I am afraid the medical services were unpopular for a time; but our previous experience had taught us the danger, and the majority of the troops had been so well disciplined that no such final catastrophe occurred. Supplies were soon dropped from the air, and ration scales altered daily until the first bulk stores arrived.

No talk of this nature would be complete without a tribute to the tremendous support the medical services received during the period from our own commanders, whose policy throughout was always to do the utmost for the troops for whom they were responsible. The troops themselves helped greatly by their high morale and sense of humour; nothing could break their spirit, although many were broken in health. The way they reacted to hardship was amazing, and whenever some calamity befell us, there was always some wag who would help to keep up the spirit of others. For instance, the Japanese at one stage issued orders that words of command were to be given in Japanese, not English, by the senior officer or non-commissioned officer present, whenever a Japanese guard was passed. One officer had failed to learn the Japanese words of command, and found himself, as the senior officer, leading a squad of prisoners of war past a Japanese guardhouse; his friends knew that he did not know the correct word of command and wondered how this officer could get out of his difficulty. On arriving at the guardhouse, he smartly turned his head and eyes to the right and saluted, and shouted at the top of his voice: "How's that?" whereupon the troops gave the "eyes right"; when the squad had safely passed, their officer completed the salute, turned his head to the front and shouted: "Not out!" This is only one of many similar incidents in which the troops demonstrated their sense of humour and high morale.

I should like also to pay a personal tribute to the officers, non-commissioned officers and men of the Royal Army Medical Corps, to the officers, assistant surgeons, non-commissioned officers and men of the Indian Medical Service, to the local Volunteer Medical Services, to the Royal Netherlands Medical Services, and to all ranks of the Australian Army Medical Corps who responded so nobly to the call and who were so ably led by Colonel A. P. Derham, whose outstanding courage, initiative, great foresight and hard work during those first very difficult six months have amazed and always will amaze me. It was an honour to be associated with him; whenever things looked particularly glum, his keen sense of humour combined with his high sense of duty never failed to brighten the horizon.

I express my thanks also to those commanding officers, officers in charge of hospital divisions, hospital medical officers and regimental medical officers, whose names are too numerous to mention, who gave me such loyal cooperation and help throughout the time of our captivity, and who turned what might have been a far more terrible catastrophe into an experience which can be looked back on in many respects as something grand.

In conclusion, I pay tribute to those colleagues of ours to whom we must be forever grateful—those who, in carrying out their duty, paid the supreme sacrifice.

#### PRISONER-OF-WAR CAMPS IN BORNEO.<sup>1</sup>

By HOWARD H. EDDEY,  
*Australian Army Medical Corps.*

COLONEL A. P. DERHAM has asked me to describe briefly the prisoner-of-war camps in Borneo—firstly, because medical conditions in these camps have not been discussed tonight or previously, and secondly, because nearly 2,000 Australians, including three medical officers, lost their lives in one of these camps. In addition to these Australian casualties, some 750 British soldiers, including several medical officers, did not survive the treatment by the Japanese in this area.

There were two main camps in Borneo—one at Sandakan (capital of British North Borneo), containing 2,000 Australians and 700 British, and one at Kuching (capital of Sarawak), containing mixed British, Australian, Dutch and Indian troops, together with a considerable number of civilian internees, the total personnel numbering about 3,000.

The Australian troops in Borneo, nearly all members of the Eighth Division captured at the fall of Singapore, consisted of two groups: "B" force, which left Singapore in June, 1942, and "E" force, which left in March, 1943. Both these forces went to Sandakan, travelling under conditions which have been adequately described in the lay Press. At the end of 1943, despite vigorous protests to the Japanese, most of the officers from Sandakan, including some of the medical officers, were transferred to Kuching; this left about 2,000 Australians, commanded for internal administration by a few officers and served for medical purposes by three medical officers, together with about 700 British troops with a similar number of officers.

As the Allied forces swept up the Pacific in their drive on Japan, the Japanese in control at Sandakan marched the fit men ("fit" being used in the Japanese sense) 140 miles inland to Ranau; the soldiers who fell out because of weakness or ill health during this arduous march were dispatched on the spot. Those that arrived at Ranau were set to perform superhuman work on starvation rations; in a few months there were few survivors, and ultimately these were killed. The sick, who were left in the Sandakan camp, also failed to survive their prolonged starvation. Of the 2,700 soldiers at Sandakan, only six, who escaped and lived with the natives until rescued by the relieving force

of Australians, lived to describe this ordeal of "B" and "E" forces.

This story of Sandakan was to be merely the herald of similar happenings at other camps. As the Allied forces approached with their landings at Brunel and Labuan, only the sudden termination of the war prevented the prisoners at Kuching from being marched inland and similarly treated. In fact, the Japanese intention was to allow no Allied prisoners to be recovered, and if the war had taken the form of a slow reconquering of the South Pacific region, probably less prisoners of war would have been rescued.

I travelled from Singapore to Sandakan as senior medical officer and surgeon to "E" force; this force, after a short period on an island in Sandakan Bay, joined the main camp of Australian ("B" force) and British troops. Conditions in Sandakan camp were similar to those you have heard described by the speakers tonight, and by Colonel A. E. Coates and associated speakers previously. We had the same problems in dealing with the Japanese, and we met them in a similar way; in fact, in discussing the difficulties that had been surmounted, we found that the medical officers in various camps had negotiated with the Japanese, argued with them, prevented them from working the sick troops, and improvised in medical and surgical treatment and equipment in much the same way; all this you have heard previously.

Two subjects of medical interest I shall mention tonight, largely because they have not been discussed before. The efficacy of the Japanese anti-dysenteric vaccine was unknown to us, but might have been expected to be useful in view of the knowledge gained by them in the "China incident". Before "E" force left Singapore, all personnel were injected with anti-dysenteric vaccine, one millilitre being given and the dose repeated in one week; a further injection of one millilitre was given on the voyage to Sandakan. On arrival at Sandakan conditions were primitive in the extreme; however, in the time during which I remained with the force we had no cases of dysentery. Admittedly we had an excellent hygiene squad; but this could not have prevented an outbreak, because, in view of the severe epidemic of bacillary dysentery that occurred during the first year of captivity in Singapore, there must have been quite a number of carriers in the force. Similar injections were given to all personnel in Kuching in 1943 and early in 1944, and the incidence of dysentery in this camp was relatively low. It was not until 1945, when the resistance of all was at its lowest, that dysentery occurred at Kuching in anything like severe proportions.

The other subject of interest is the condition which affected nearly everybody at Sandakan—namely, tropical ulcer. This condition has been described tonight, and the methods of treatment, such as hot packs, excision, carbolicization, sequestrectomy and in the severe cases amputation, are well known. In the early phases of tropical ulcer it was noticed that the condition often improved remarkably during a malarial relapse; this was attributed to the hyperpyrexia. At this time we had some stocks of peptone, and the production of artificial pyrexia was carried out in early cases with considerable success; the ulcer was either completely cleared up or, in the more severe cases, the spread was arrested, so that the ulcer was able to be dealt with more certainly by the usual methods. However, as happened with all our drugs, supplies ran out, and this interesting line of research was brought to an end.

Towards the end of our captivity the attitude of the Japanese in command at Kuching underwent a profound change. At this time the death rate from starvation was reaching tremendous proportions, and as the Japanese realized that they would be brought to account, they did what should have been done early in our captivity. They had taken over a large portion of the civilian hospital in Kuching for use as a military hospital, but as the hour of reckoning approached, they ordered that part of the hospital should be taken over by, and used for, the prisoners of war. Assisted by Captain I. C. Heinz, of Melbourne, I went in charge of a medical detachment from the prisoner-of-war camp to take over this hospital from the

<sup>1</sup> Read at a meeting of the Victorian Branch of the British Medical Association on May 1, 1946.



Japanese. The conditions under which the Japanese ran this once first-class hospital were deplorable. Sick Japanese soldiers, largely unattended, were lying in the hospital surrounded by unimaginable filth; the sanitary system did not work, the kitchen was dilapidated, the operating theatre annexe had been used as a small cook-house, the dispensary was non-existent, and the lighting system did not work. However, with the aid of a team of Chinese coolies, the hospital was cleaned up and the Japanese sick were evacuated. The Japanese then provided hospital beds, mattresses, mosquito nets and some drugs, and some of the sick prisoners of war were brought to the hospital, where reasonable treatment could be instituted.

As soon as the first medical detachment from the relieving Ninth Division force at Labuan arrived at Kuching, bringing plasma and blood with them, these sick were able to be rescued from the grave. This final episode of my life as a prisoner of war showed forcibly how, given a little cooperation from our captors earlier in our captivity, many more lives of prisoners would have been saved. This lack of cooperation was the main difficulty with which we, as medical officers, had to contend during our incarceration.

#### SOME ASPECTS OF PROTEIN METABOLISM IN INFANTS AND CHILDREN.

By F. W. CLEMENTS,

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THE protein in the diet of infants and children performs the special function of supplying the basic materials for the formation of new soft tissue—that is, for growth. This paper reports the results of a study of the effects of diets rich in protein, given in certain special circumstances, upon the growth of infants and young children. Before these observations are presented, some features of the protein metabolism of infants and children will be discussed.

#### Theories of Protein Metabolism and their Application.

The brilliant work of Schoenheimer<sup>(1)</sup> has made possible the acceptance during the last three or four years of a new concept of protein metabolism,<sup>(2)</sup> which has helped to throw light upon some hitherto unexplained facts.

According to the classical theory of protein metabolism developed by Folin,<sup>(3)(4)</sup> a certain amount of the protein in the diet of an adult was used to replace the protein elements worn out in the ordinary working of tissue cells, and the excess was excreted. It was recognized that in the infant and child a high percentage of the protein ingested was used for the building of tissue. This theory implied that the retained portions of the protein absorbed proceeded after appropriate resynthesis to the tissues where they were stored. Once this protein had entered the tissues it was assumed that it remained there, and the amount of protein that could be stored in a unit of tissue was believed to be fixed. This implied that there was an upper limit to the quantity of protein that could be utilized by the infant in a unit of time.

Some paediatricians<sup>(5)(6)</sup> assumed that an average consumption of breast milk of average protein content provided enough protein to enable these upper limits to be reached. It was argued that if a breast-fed infant consumed more protein than that provided by human milk, the additional protein would be excreted by the kidneys as nitrogen.

A modern concept of protein metabolism<sup>(7)</sup> pictures the intracellular proteins of the animal body in a continuous process of degradation and resynthesis. According to Whipple,<sup>(7)</sup> not all the intracellular proteins are subject to this continual breakdown; he suggested that they exist in three forms—namely, labile reserve protein, dispensable

reserve protein and indispensable fixed protein. These three "forms" are not distinguishable chemically. It is apparently the labile reserve protein fraction which, in the normal subject, takes part in this breakdown process.

By the use of the isotope N<sup>15</sup> Schoenheimer and his co-workers<sup>(1)</sup> demonstrated that most of the peptides and amino acids liberated by this degradation process join, in the metabolic pool, the protein products entering there from the diet. The component parts for the resynthesis of tissue proteins are drawn from this common pool, which probably is in the plasma and tissue fluids. In the process of resynthesis certain proteins seem to have a higher priority than others. Thus the protein fraction of hemoglobin appears to have the first claim on these protein components, whilst plasma proteins and those of the liver and visceral musculature have a higher priority than those of skeletal muscles and skin.<sup>(8)</sup>

According to this theory, the amount of protein laid down in the muscles of an infant will depend upon the balance left after the demands of the high priority tissues have been met. This in turn will depend upon the "head of pressure" of protein components in the metabolic pool. As almost all these components come from the proteins of the diet, it follows that the level of protein in the diet determines, up to a point, the amount of protein available for the expansion of muscle tissue. When the infant is receiving a diet poor in protein, or during periods of absolute or relative protein starvation, the components for the manufacture of the essential proteins are provided from the breakdown of tissue proteins. At first there are enough of these to maintain the essential proteins—for example, the plasma proteins—at their normal level; but this can be achieved only at the expense of the skeletal muscle proteins. Under these conditions less protein is resynthesized into the skeletal muscles in a unit of time than undergoes degradation, and as a result the muscle loses volume.<sup>(9)</sup> Later, unless supplies are provided from the diet, the quantity available is insufficient to maintain even the essential protein at a normal level, as demonstrated by the fall in serum protein in the moderately advanced stages of protein deficiency.<sup>(10)</sup>

Nitrogen balance experiments<sup>(11)(12)(13)(14)(15)</sup> have demonstrated that the nitrogen metabolism of breast-fed infants is different from that of artificially fed infants, and for this reason it is necessary to consider breast-fed and artificially fed infants separately.

Macy and her co-workers<sup>(16)(17)</sup> have studied the composition of a large number of samples of human milk and have stated that the level of protein in the milk from any one woman may fluctuate within limits, but that the mean value is at a level characteristic for the woman.<sup>(17)</sup> Thus Macy found that the mean values for the protein content of the milk from three women were respectively 0.9, 1.1 and 1.4 grammes per 100 millilitres. Such differences, which according to Macy are constant, have a significance in infant nutrition. More than 90% of the calories of human milk are contributed by the fat and lactose, and any deficiency of these (particularly the former) is compensated for by fluctuations in the supply of milk. Since protein contributes less than 10% of the Calories, it follows that an infant may obtain enough Calories to maintain growth at normal rates and yet the milk may be absolutely or relatively low in protein, and thus the infant may not obtain enough of the latter to ensure an optimal supply of components for the maximum deposition of protein in skeletal muscles.

The level of protein consumption of artificially fed infants is determined by the strength of cow's milk used. The average protein content of pooled cow's milk is 3.5 grammes per 100 millilitres, in contrast with an average of 1.3 grammes per 100 millilitres for human milk. Although diluted cow's milk mixtures were advocated by Michael Underwood as early as 1784<sup>(18)</sup> and again by Condie in 1847,<sup>(19)</sup> the use of diluted cow's milk did not become widespread until about the 1880's. The principal stimulus to its use was an attempt to eliminate the frequent and disastrous epidemics of gastro-enteritis that swept through the foundling institutions in Europe during the eighteenth and nineteenth centuries.

<sup>1</sup> Although Whipple uses the word "form", it is probably more strictly accurate to consider the protein existing in "three quantitative categories".

About 1890, J. F. Meigs,<sup>(13)</sup> an American paediatrician, following the fashion of the time, devised a cow's milk mixture that contained milk, cream, sugar and water; it had the following composition: protein 1.2%, fat 3.5%, and sugar 6.7%. This mixture closely resembled the composition of human milk.

During the last fifteen to twenty years the trend has been towards mixtures with higher protein content, so that now it is not uncommon for infants, even young infants from two weeks onward, to be given undiluted cow's milk.<sup>(12), (14)</sup> Exponents of this latter practice hold that the infants receiving this diet, partly because of the high protein intake, grow at a more satisfactory rate than infants of the same age given lower concentrations.<sup>(12)</sup>

The results of nitrogen balance experiments provide useful information on the levels of protein retention in infants receiving different amounts of protein. Two breast-fed infants,<sup>(15)</sup> each aged three and a half months, retained approximately 0.5 gramme of nitrogen per day on an intake of about 1.4 grammes daily, whilst a group of artificially fed infants of the same age,<sup>(12), (14)</sup> given undiluted cow's milk, retained about 1.0 gramme of nitrogen on intakes of between three and four grammes of nitrogen per day.

Nitrogen retention is related to intake, and for this reason the chemical composition of healthy artificially fed infants who have received undiluted cow's milk is different from that of a healthy breast-fed infant. The nitrogen content of the former is higher. This has been noted by Romenger and Meyer<sup>(16)</sup> and by Stearns.<sup>(19)</sup>

Some of the clinical manifestations of protein deficiency have been recognized for some time. As early as 1896 Cheadle<sup>(21)</sup> stated that "deficiency of nitrogenous food shows its evil mask quickly; the child's growth is interrupted; it becomes flabby and soft of muscle, pallid, feeble; vigour, vitality and the power to resist disease decline". Conversely, the effects of high protein feeding have been noted more recently by Jeans.<sup>(22)</sup> He has observed that the greater retention of nitrogen is represented by larger amounts of tissue protein—that is, by an increase in muscle mass.

The majority of breast-fed infants who gain weight at the normal rate have firm skeletal muscles with good tone. However, a breast-fed infant is occasionally encountered who, although gaining in weight at the normal rate (in some instances much faster than normal), has poor muscle tone. This could be explained on the grounds that the milk was relatively poor in protein.

Of more significance than muscle size and tone is the relationship of the development of immunity to the level of protein nutrition. Active immunity to many diseases usually develops in infancy and childhood. During the last few years the work of a number of investigators<sup>(23), (24), (25), (26)</sup> has demonstrated that an antibody is but a specially modified molecule of serum globulin, which is synthesized from the common metabolic pool of protein components. Evidence is accumulating to strengthen the suggestion that most, if not all, the antibodies are associated with the  $\gamma$  globulin.<sup>(26)</sup> It has been shown in laboratory animals that antibody formation is reduced when the diet is poor in protein.<sup>(26)</sup>

Krebs<sup>(27)</sup> has recently shown that the  $\gamma$  globulin fraction of the serum protein in a subject suffering from malnutrition (characterized amongst other factors by a low protein intake) rose from a relative percentage of 4.7 to 13.4 when the subject was given a diet rich in protein. Although it is far from proved, the evidence available does suggest that the degree of immunity may depend upon the level of protein intake.

The foregoing comments suggest that the level of protein reserves in the infant's body should be kept at the highest possible level, and that if anything occurs to interfere with the maintenance of that level, steps should be taken to bring about a restoration. The cases reported later in this paper are examples of attempts to do this. For reasons that will become apparent, the subjects have been divided into two groups—those aged under ten months and those aged between ten and twenty-four months.

#### Protein Metabolism in Infants Aged Under Ten Months.

Nature has provided breast milk with an average protein composition of 1.3 grammes per 100 millilitres, and although this is well below the protein strength of an equal quantity of undiluted cow's milk, it is reasonable to assume that the amino acid content of human milk is such that the body is able to make the maximum use of the lower intake.

The difference between the amino acid content of human milk and cow's milk is such that, in order that artificially fed infants may be provided with the same quantity of essential amino acids, they should, except for short introductory periods, be given mixtures made up of at least 50% cow's milk.<sup>(28)</sup>

Whilst the protein intake of healthy infants, aged under ten months, who have been fed according to the accepted methods, varies over a limited range, it can be assumed that the actual intake in most cases is sufficient to maintain an adequate protein reserve within the body. If, however, the normal consumption of protein is interfered with, as for example in an acute illness, during an attack of gastro-enteritis or from the sudden temporary loss of maternal milk, then the supply of protein components in the metabolic pool must be drawn solely from the labile protein of the skeletal muscles. When this happens the infant fails to gain in weight and frequently loses weight. (In this regard it should be remembered that every gramme of protein deposited in muscle tissue takes with it approximately four grammes of water.<sup>(29)</sup>)

Young infants do not tolerate starvation or even semi-starvation well, even when presumably sufficient fluid is given. They quickly take on a characteristic appearance, becoming obviously thinner, whilst the face is drawn and bluish in colour. The skeletal muscles become soft and flabby. The degree of these changes depends upon the age of the infant and upon the extent and duration of the starvation. It is often surprising how rapidly these signs appear. An infant who has been examined regularly each week and has been in good health can return after an interval of one week presenting many of the above-mentioned signs. The protein withdrawn from skeletal muscles is not only used for the synthesis of the more essential proteins but, in the absence of sufficient consumption of calories, it assists in the maintenance of basal metabolism.

In these cases additional protein is indicated in the period of convalescence, and for this purpose the following prescription has been used:

#### Number 1 Protein Mixture.

|   |                       |
|---|-----------------------|
| Fine casein (90 mesh)   | } equal parts of each |
| Dried skim milk   |                       |
| (One medicinal tablespoon contains 6.0 grammes of protein and 2.2 grammes of carbohydrate.) |                       |

It is customary to commence the medication with half a teaspoonful given with each normal feed, increasing the dose rapidly to one and a half to two medicinal teaspoons at each of the five feeds in the day. It is my experience that the powder is best mixed with about the amount of water necessary to make a fairly thick gruel. Intakes of seven and a half teaspoons per day provide 11 grammes of protein per day.

The details of two patients from the series seen and treated at the mothercraft centres at Canberra provide data for further discussion.

CASE I.—When T.S., a normal, healthy, breast-fed infant, was four weeks old, the mother suffered an acute influenza attack, and the family physician advised that the infant should be segregated from its mother. The infant was fed on liberal quantities of glucose and water (strength varied) for five days and then returned to the breast. The infant was examined at the mothercraft clinic on the eighth day. In a fortnight it had lost eighteen ounces in weight and looked thin and miserable. Although a twenty-four hours test feed showed the infant to be receiving the average amount of breast milk for its age, it was decided that, because of the loss of protein during the five days of semi-starvation, the infant should be given additional protein. The response can be seen in the weight chart (Figure I). The clinical improvement was equally pronounced. The

pinched, bluish appearance was gone in a week, and the muscles commenced to harden.

CASE II.—B.F., aged nine weeks, when brought to the mothercraft centre for the first time, weighed seven pounds one ounce. From birth the management, including the feeding schedule, had been unsatisfactory. The infant had been fed on a number of artificial mixtures; the main fault of all was that they contained a low concentration of cow's milk. The infant was thin, the skin was dry and wrinkled. Very little development had occurred in the skeletal muscles, which scarcely differed from those of a newly born infant. The mother complained that the infant would not consume all the contents of its bottle. In view of the poor muscle development and tone, it was decided to give the infant a diet rich in protein. Number 1 protein mixture was given, in addition to a formula containing 50% of cow's milk. In this way the protein intake was raised to 25 grammes per day instead of the 14 grammes provided by the milk mixture alone. The improvement in weight was spectacular (Figure II), and this was accompanied by a noticeable filling out of the muscles and a general improvement in appearance.

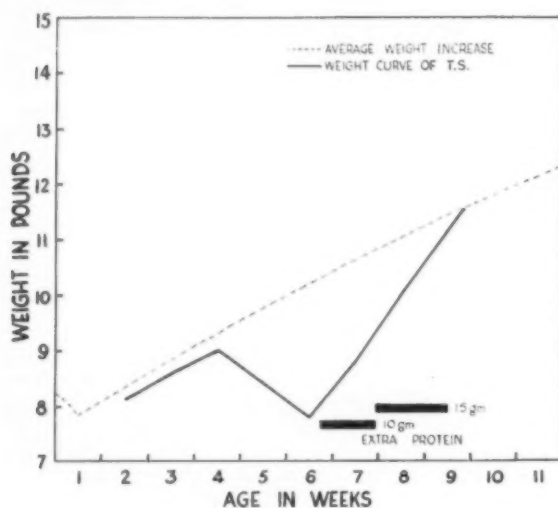


FIGURE I.  
Increase in weight of infant given number 1 protein mixture as indicated.

The use of a rich protein supplement is indicated for young infants who have lost weight through semistarvation, whether due to illness or to an incorrect feeding routine. It is my experience that the additional protein leads to a more rapid recovery of normal weight than is usually achieved by the use of breast milk alone or of the usual cow's milk formulae.

I have found that the number 1 protein mixture is well tolerated by young infants. The youngest in the present series was three weeks old. Gordon and Levine<sup>(31)</sup> have used diets rich in protein with complete success for newly born premature infants. That young infants can tolerate mixtures rich in protein is the experience of other paediatricians.<sup>(32)(33)(34)(35)</sup>

#### Protein Metabolism in Older Infants.

So long as a normal, healthy infant is deriving the bulk of its Calories from milk, either human or modified cow's milk, there is little likelihood that it will suffer from an inadequate intake of protein, unless in such circumstances as those detailed earlier. It is after he has graduated to three meals a day that the normal healthy infant is likely to become the victim of an inadequate protein intake. Three meals a day can furnish satiety and sufficient Calories and vitamins and yet be poor in protein.

Scanty information is available on the protein requirements of older infants. One important contribution has been made by the Russian school. As a result of metab-

olism experiments, one group<sup>(36)</sup> concluded that infants about eighteen months of age should receive at least 3.5 to 3.6 grammes of protein per kilogram per day, whilst another group<sup>(37)</sup> concluded that the optimal retention of nitrogen in children aged one and a half to three years occurred when the protein intake was approximately 4.0 grammes per kilogram of body weight per day.

The Technical Commission of the Health Committee of the League of Nations<sup>(38)</sup> recommended 3.5 grammes per kilogram of body weight per day; Leitch and Duckworth,<sup>(39)</sup> after reviewing the literature, which included the Russian work, recommended four grammes per kilogram of body weight per day. The Food and Nutrition Board<sup>(40)</sup> of the National Research Council of America proposed for toddlers one to three years of age 40 grammes of protein per day. For infants of normal weight this represents 4.2 to 2.9 grammes per kilogram of body weight per day.

Levine,<sup>(41)</sup> in discussing the problem, accepted this figure and suggested that the diet should be so adjusted that approximately 50% of the dietary protein is supplied by

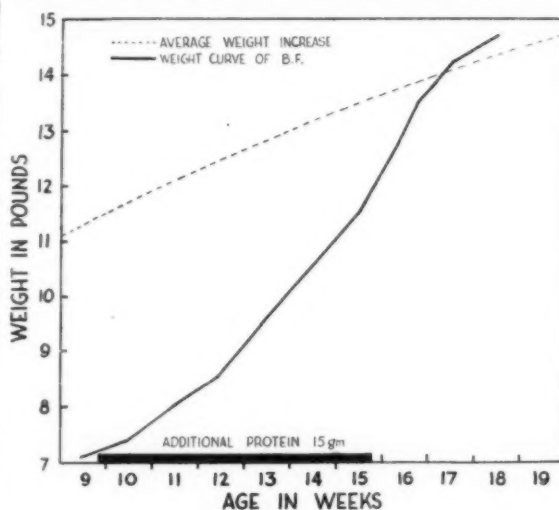


FIGURE II.  
Increase in weight of infant given number 1 protein mixture as indicated.

milk, 25% by meat and eggs, 15% by bread, cereals and potatoes, and the remaining 10% by fruit, vegetables and other foods. When these figures are translated into food-stuffs, it is found that the following quantities of food must be included in the diet:

Milk: 24 ounces per day.

Meat: 1 chop, or 1.5 ounces of chopped steak, or 1.5 ounces of fish per day.

Eggs: 4 per week.

Bread: 1 slice per day.

Cereals: 0.5 cup per day.

Potatoes: 2 tablespoons per day.

Vegetables: 3 tablespoons (mixed).

Whilst many infants enjoyed this diet regularly, we discovered during the course of an investigation into the cause of unsatisfactory growth of toddlers that it is not uncommon for infants to consume much less than 40 grammes of protein per day, with subsequent interference with growth. The following is a typical history.

E.N. was a normal, full-term infant; the health and diet of the mother during pregnancy were satisfactory. The infant was breast fed to the age of eight and a half months; "educational diet" was commenced at five and a half months. The weight curve and general progress were satisfactory to twelve months of age. At about this age the child reduced the milk intake to not more than half a pint per day. The behaviour of the weight curve over the next six months is shown in Figure III. When questioned about the child's diet from twelve to seventeen months of age, the mother

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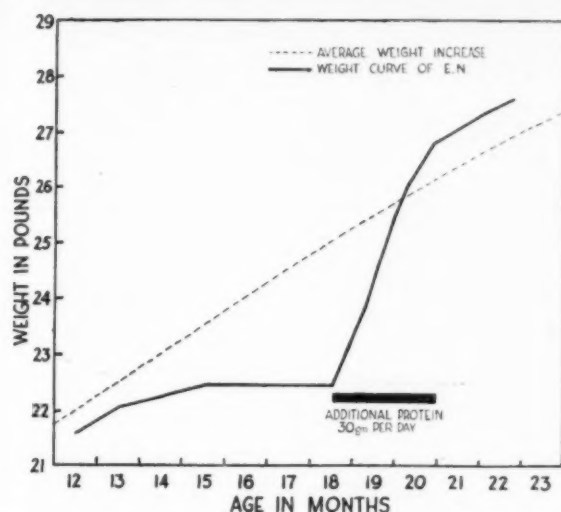


FIGURE III.

Increase in weight of infant given number 2 protein mixture as indicated.

said that the child ate "plenty of food", but did not drink more than half a pint of milk daily, did not like meat or fish, had few eggs, but ate cereals, vegetables and dessert dishes willingly. From seventeen to eighteen months the appetite had become capricious, and it was this factor, together with the general trend of the weight curve, that had caused the mother to seek advice. The mother offered the information that the child was very active and so far as she knew "healthy". The physical examination revealed no abnormality other than poor skeletal muscle tone. The haemoglobin value was 82%. A rectal lavage late in the evening after the child had been in bed for several hours failed to reveal any *Enterobius vermicularis*.

This description, with variations relating mainly to age of onset and to diet, has now been recorded for 25 young children during the last two years. A review of the dietary histories showed in most cases a poor protein intake, due partly to small consumption of milk and to the nature of the midday meal. Some mothers have something of a phobia about the inclusion of meat in the diet of infants and young children, and during this investigation it was surprising to find how frequently meat was omitted from the midday meal. An outstanding feature of many of these cases was the relatively high consumption of animal brains. Brains are soft, and the mother frequently believes them much more digestible and so more suitable for the infant than muscle tissue. Although it is customary to

recommend that a set of brains be served once a week with the midday vegetables, when the position was investigated six of the 25 subjects were eating animal brains four times a week and eight others twice a week.

The dietary patterns of seven infants selected from the series whose weight charts had been unsatisfactory are given in Table I. Included in the table is a satisfactory diet for an infant of the same age.

An assessment of the nutritive value of the seven diets listed in the table shows them to be poor in protein and calcium, with doubtful thiamin and riboflavin content. Without an accurate check on the amount of each foodstuff eaten, it is impossible to assess the caloric value of these diets. As many of the infants had capricious appetites, it is probable that some of these were at the time of investigation consuming insufficient calories to sustain growth at the normal rate.

It has been shown by Clements<sup>(42)</sup> that breast-fed infants who are suffering from partial thiamin deficiency do not gain in weight at the normal rate. Because of the high cereal intake it was not expected that the older infants and young children whose case histories are reported here would be suffering from a partial thiamin deficiency. However, in order to make sure that neither a thiamin nor a riboflavin deficiency was a factor in the unsatisfactory growth of these infants, several were given vitamin therapy. A number was given three milligrammes of thiamin per day for three or four weeks and a number was given three milligrammes of riboflavin per day for three or four weeks. Some infants were given both thiamin and riboflavin. In no case did these vitamin supplements have any appreciable effect on the weight or the appetite of the infant.

The prominence of animal brains in the diets of many of the infants in this series called for special inquiry. It is probable that animal brains, particularly sheep's brains, are more widely used in human dietaries in Australia than in any other country. The soft character of this foodstuff commends itself to mothers as an ideal item for the transitional period from liquid to solid food. The possibility that the high consumption of brains may have been an aetiological factor in the failure of these infants to gain weight was made the subject of a special study.<sup>(43)</sup> From this work, and from the fact that many infants whose health and weight progress is quite satisfactory eat one and sometimes two sets of a brains a week, it is safe to assume that the consumption of brains *per se* is not detrimental to satisfactory growth. However, the relatively low protein content of brains—namely, 8%<sup>(44)</sup>—in contrast to 14% or 15% in muscle, means that they are a relatively poor source of protein and that the frequent inclusion of brains in the diet to the exclusion of muscle tissue would lower the total protein intake.

The other obvious deficiency, protein, was investigated in detail. It was decided that the most satisfactory approach to the problem of the possible effects of the low

TABLE I.

The Estimated Average Daily Food Intake of a Number of Infants whose Weight had been Stationary for Some Time, Contrasted with the Food Intake of an Infant (A.Me.) whose Weight was Satisfactory.

| Child.   | Age in Months. | Estimated Average Consumption of Foods of Animal Origin. |                         |                          |                          | Average Daily Intake of Protein from Animal Sources. (Grammes.) |            |              |            |        | Average Daily Intake of Protein of Vegetable Origin. (Grammes.) | Estimated Total Intake of Protein. (Grammes.) |
|----------|----------------|--|-------------------------|--------------------------|--------------------------|---|------------|--------------|------------|--------|---|---|
|          |                | Milk. (Ounces per Day.)                                  | Meat. (Ounces per Day.) | Brains. (Sets per Week.) | Eggs. (Number per Week.) | From Milk.  | From Meat. | From Brains. | From Eggs. | Total. |   |   |
| M.A. ..  | 15             | 10   | Nil                     | 2                        | 4                        | 9   | —          | 2.6          | 3.7        | 15     | About 10  | 25  |
| A.S. ..  | 24             | 12   | Nil                     | 2 or 3                   | 7                        | 11  | —          | 3.3          | 6.5        | 21     | About 10  | 31  |
| R.D. ..  | 20             | 10   | 0.5                     | 2                        | Nil                      | 9   | 3.3        | 2.6          | —          | 15     | About 10  | 22  |
| S.P. ..  | 12             | 8  | Nil                     | 1                        | 4                        | 7   | —          | 1.3          | 3.7        | 12     | About 10  | 22  |
| L.P. ..  | 17             | 12   | Nil                     | 2                        | Nil                      | 11  | —          | 2.6          | —          | 14     | About 10  | 24  |
| P.K. ..  | 21             | 15   | 0.25 "very little" 0.25 | Nil                      | 4                        | 14  | 1.7        | —            | 3.7        | 20     | About 10  | 30  |
| E.N. ..  | 16             | 7  | 0.25                    | 2                        | 4                        | 6   | 1.7        | 2.6          | 3.7        | 14     | About 10  | 24  |
| A.Me. .. | 15             | 30   | 1                       | —                        | 4                        | 27  | 6.5        | —            | 3.7        | 37     | About 9   | 46  |

protein intake was to give the infants a diet rich in protein. The fact that the infants had poor appetites meant that a concentrated form of protein had to be provided if this was to be achieved. After experimentation with various foodstuffs rich in protein, the following formula was adopted:

**Number 2 Protein Mixture.**

|                       |     |
|-----------------------|-----|
| Commercial casein     | 60% |
| Dried skim milk       | 20% |
| Wheat germ (powdered) | 10% |
| Maize protein         | 10% |

The wheat germ and the maize protein were ground into a fine powder and passed through a "60" mesh screen. One hundred grammes of this mixture provided approximately 73 grammes of protein; thus one level medicinal tablespoon contains seven grammes of protein. The instructions issued to the mother are as follows:

Start with one medicinal teaspoonful and increase by one teaspoonful daily until four medicinal teaspoonsful are used.

Two ounces of milk. Heat and pour onto the mixture while stirring. Cook for one minute.

Use more milk if desired, or add one tablespoonful of tomato juice to cooked mixture.

Add pinch of salt.

One teaspoonful of sugar (white or brown).

It is suggested to the mother that every effort be made to give at least four tablespoons per day, six if possible.

Twenty of the 25 patients treated with this mixture showed a similar response characterized by the following improvements: (a) large weekly gains in weight, evident in some cases after one week's treatment, but more frequently commencing in the second or third week (see Figures III, IV and V); (b) recognizable improvement in muscle tone after a few weeks on the diet; (c) the frequent observation by the mother that the child's appetite, particularly for milk, had greatly improved. From the mother's point of view this was the most important improvement. Once appetite was restored and the child had been established on a diet containing at least 40 grammes of protein per day, the protein powder was discontinued and the good progress was maintained.

**Discussion.**

The concentrated protein therapy described in this paper was used to restore the level of protein within the body after it had become reduced through starvation or after a

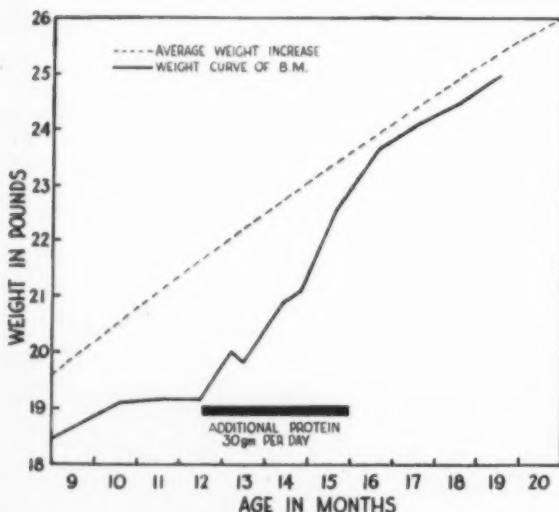


FIGURE IV.

Increase in weight of infant given number 2 protein mixture as indicated.

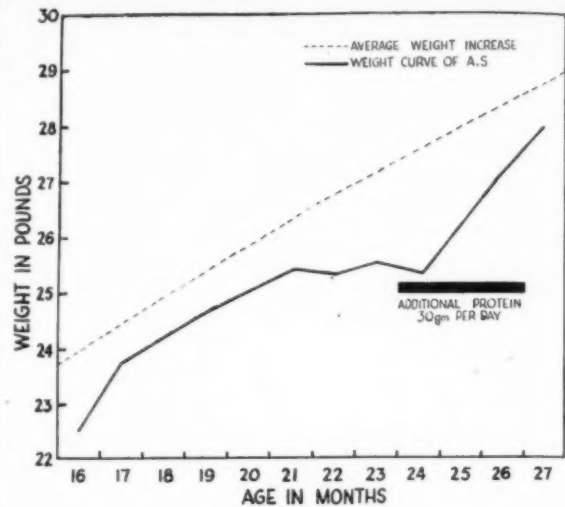


FIGURE V.

Increase in weight of infant given number 2 protein mixture as indicated.

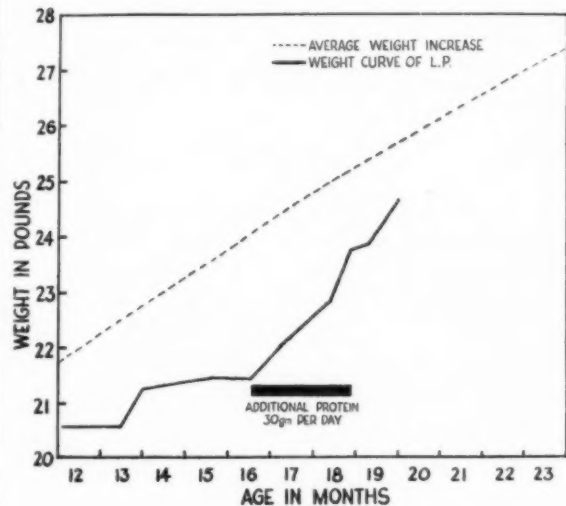


FIGURE VI.

Increase in weight of infant given number 2 protein mixture as indicated.

prolonged period of low protein intake. The present observations suggest that lack of appetite is one of the first manifestations of the effects of a diet poor in protein for an extended period. Lack of appetite, with its accompanying reduced food intake, is followed by failure to gain in weight at a satisfactory rate. At this stage it is possible only to speculate as to the relationship of low protein intakes to loss of appetite.

A poor appetite and lack of interest in food are one of the commonest complaints of the mothers of toddlers. It has been shown that, in order to obtain the recommended daily intake of protein, the young child must consume in various forms at least one and a quarter pints of milk daily. The number of infants who "go off" milk once they are established on a three-meals-a-day routine is considerable. This fact, coupled with a lack of interest in meat, means a diet poor in protein. So far as I can remember,

I have not encountered the complaint of poor appetite for other foods in a child who was offered and consumed a diet of meat and reasonable quantities of milk.

Whether the taking of a diet deficient in protein over a prolonged period is a major cause of poor appetite in children yet requires to be proved; but the results of the tests reported here suggest that it was the cause in a high percentage of the cases investigated.

The possible effect of diets rich in protein upon the digestive and urinary systems calls for special comments. Smith<sup>(42)</sup> has reviewed the literature on the structure and function of the stomach and intestines of the newborn infant, and has concluded that "the evidence indicates that the protein-splitting enzymes and protein-absorbing pathways function extremely well as soon as digestion becomes established after birth".

Gordon and Levine,<sup>(46)</sup> who had had extensive experience with premature infants during the preceding ten years, showed that diets rich in protein—containing as much as nine grammes of protein per kilogram of body weight per day—for short periods, were well tolerated.

The protein mixtures used in these experiments contain from 60% to 75% of protein, but as they were given with the normal meals, the high concentration of protein was reduced by mixture with other food. Not one infant given either of these mixtures showed any gastro-intestinal disturbance as a result of the protein. This confirms the experience of others.<sup>(32) (33) (34) (35)</sup> Diets rich in protein, particularly those containing a high percentage of milk proteins, can be given to infants without any digestive ill effects.

In the therapeutic use of protein-rich mixtures the kidneys must be subjected, for the period of the high protein medication, to the burden of excretion of extra nitrogen. Whether this is detrimental is open to speculation. Without metabolism experiments it is not possible to assess the percentage of nitrogen excreted; but in considering this problem it must be appreciated that the high protein therapy aims at restoration of depleted protein reserves. Again, metabolism experiments are needed to determine the extent of the nitrogen "wastage" associated with this process.

#### Summary.

1. The application of the various theories of protein metabolism to the methods of infant feeding is discussed.
2. The effects of a protein-rich supplement upon the weight curve and general appearance of starved or semi-starved young infants are presented.
3. The signs of chronic protein deficiency in older infants, for example those aged from ten to twenty-four months, are discussed.
4. The results of a protein-rich supplement upon the weight curve and appetite of a group of infants are given.

#### Acknowledgement.

I desire to acknowledge the assistance rendered by Miss Stenhouse, of the staff of this institute, in the development of the protein mixtures, and also to the sisters at the Mothercraft Centres, Canberra, for the interest they took in these cases.

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# THE CONSTITUTION AND POLICIES OF THE FEDERAL COUNCIL.<sup>1</sup>

By ALAN E. LEE,  
*Brisbane.*

WHEN I was asked to speak to a meeting of the Queensland Branch on the work of the Federal Council I was glad to do so for several reasons.

In the first place its work is often not familiar to members who do not belong to Branch Councils. Though in a general way most doctors know that the Council is formed of two representatives from each Branch, that it meets at rather infrequent intervals, and that much of its work is related to Federal Government activities, I doubt whether its history, or its exact constitutional relation to the Branches, or the extent to which its decisions are binding on the individual doctors of Australia is known to more than a small minority of members.

Secondly the published statements of the Commonwealth Minister for Health in regard to proposed free medical services make it essential that the part to be played by the Council in the negotiations that must ensue should be known, and that the policies on which it bases its actions should be understood and approved.

And thirdly it should be known that on behalf of the Queensland Council I have given to the Federal Council a certain notice of motion, which, if accepted by the Council, will set in train a change in the organization of the British Medical Association in Australia of a far-reaching kind; and it is desirable, if your Council is to retain the trust of the Queensland profession, that this meeting, as representing the general body of members, should approve of this action.

The Federal Council of the British Medical Association in Australia was incorporated only in 1933, but since 1911 a Federal Committee had been in existence.

That evolution must result from the mutual interreaction of an organism and its environment is no less true of groups than of individuals, and the changing environment of the Australian medical profession was the initial stimulation to the formation of a federal bond of union amongst the Branches in Australia.

Since their formation in earlier colonial days, the State Branches of the British Medical Association had pursued their individual ways, carrying out for its members within their boundaries the duties and functions delegated to the local Councils by the Parent Body.

In a general way, provided the local administration and rules kept within its Memorandum of Association, the State Councils were free to administer their own affairs so far as such affairs were of local concern and did not affect the Association outside Australia.

But it gradually became clear that it was no longer sufficient for each Branch to consider its own problems without reference to the policies of neighbouring Branches.

Although the Federation of the Australian Colonies had been a political reality for a decade, neither in its Constitution nor by its actions did the Commonwealth Government in its early years make much impact upon the individual doctor.

But in 1911 the advent of national insurance in England, and the accession to power in Australia of a Labour Government, which threatened both national insurance and the nationalization of hospitals, convinced the Australian profession that it must determine a unified policy towards these federal designs, and the formation of a Federal Committee was the initial step along this path.

As originally contemplated there was to be no permanence about this committee.

Before agreeing to take part in its formation, the New South Wales Council published the following statement:

The New South Wales Branch understands:

- (1) That although the term Federal Committee is adopted, there is no constitutional federation of the Branches.

<sup>1</sup> Read at a meeting of the Queensland Branch of the British Medical Association on August 2, 1946.

- (2) That no Branch surrenders any function, duty or power to the Federal Committee.

- (3) That the formation of the Federal Committee is a temporary expedient to provide a means whereby common action may be taken by the Branches, and whereby the Association (in Australia) may speak with one voice pending an alteration of the Constitution of the British Medical Association providing for the federation of the Branches in Australia and the creation of a Council of the British Medical Association in Australia.

That the desire of the founders of the Federal Committee was the federation of the Branches in Australia was also explicitly stated at the first meeting of the committee when it was resolved:

That a communication be sent to the British Medical Association pointing out that in view of impending legislation affecting the profession in Australia such as national insurance and the nationalization of hospitals, the Federal Committee recognizes the imperative need of cooperative action of all the Branches to be brought about only through the federation of the Branches, and urges the prompt consideration of the following motion, notice of which had been given for the Annual Representative Meeting to be held in Liverpool in 1912, viz:

That the Constitution of the British Medical Association be amended—

(A) so as to provide

- (1) for the creation of an Australian Council consisting of members elected by the Branches in Australia, and having such powers and duties as will enable it to administer the affairs of the Association in Australia in so far as such affairs are of local concern, and do not affect the Association outside Australia;
- (2) for the holding of general meetings of the members residing in Australia;
- (3) for the creation of a representative body in Australia analogous to the representative body of the Association; or

(B) so as to provide in some other manner for the federation of the Australian Branches with autonomy in regard to matters of Australian concern only.

Though this Federal Committee started life only as a temporary expedient, it exhibited, like many other such expedients with which we have been familiar in recent years, a surprising tenacity of life. Twenty-one years were to elapse before its sphere of usefulness was regarded as ended, and it was replaced by the Federal Council.

The weakness of the Committee and the promise of the new Council were well stated in a leading article in 1933.

The chief handicap of the Federal Committee was that it had no power to initiate new movements or to institute reforms; it dealt only with matters brought before it by the Branches.

The Federal Council which takes the place of the Federal Committee will have wider powers. The medical profession will therefore expect more from it.

If the Federal Committee failed to deal with large questions affecting the whole of Australia, it was the fault of the Branches for not setting the machinery in motion. If the Federal Council fails to give a lead in similar matters, the Branches and their members will hold it responsible. Should the leaders fail, the remedy is in the hands of the Branches; they are the masters of the Federal Council.

The writer of this article evidently believed that with the new Federal Council the era of coordination and reference back to Branches for decision and executive action was finished, and that now a federal leadership and government would be possible in the medical sphere.

For some years no great and contentious matters occupied the attention of the profession, and whether such leadership had been achieved did not become at once apparent. Certain it was, however, that the federalization of the profession envisaged by the founders of the Federal Committee was still not achieved.

In 1938, when the Australian Branches were faced with a second threat of national insurance, the English Council was again approached with a view to granting greater autonomy to the Australian profession, and governing

control to the Federal Council, but although it was favourably disposed, the outbreak of war prevented any decisive action being taken.

Only in the past two years have the powers of the Federal Council been clearly defined.

Consisting as it does of two delegates from each State it must sometimes happen that a certain State finds itself in a minority position; and the question then arises whether under such circumstances this State is bound by the majority decision of the Federal Council.

Some years ago our Queensland Council found itself in a minority position in relation to a matter to which it attached great importance, and inquiry was made of the Federal Council whether its decision bound the Branches in matters common to the Branches. Because of a difference of views in that Council legal opinion was sought by it.

Both Tress, Cocks and Maddox, solicitors to the Federal Council, and also Mr. Kitto, K.C., stated that there was nothing in the constitution of the Federal Council that empowered it to bind either Branches or individual members to its decisions.

While stating that there was nothing in its legal status, which was that of a limited liability company, registered under the New South Wales Act, which enabled it to bind anyone to its decisions (unless possibly the twelve members of the Council, and the law even in this regard was uncertain), Mr. Kitto stated that since the Branches had set up the Federal Council for the purpose of joint negotiations, and annually elected delegates to it for that purpose, there was at least a moral duty cast on the Branches of accepting the decisions of the Federal Council, even if there was no legal one.

In view of this statement of the comparative legal impotence of the Federal Council, it appeared as though additional powers were required.

Why anyone should have thought the Federal Council already possessed governing powers is not clear.

That the old Federal Committee possessed none was implicit in the statement of the New South Wales Branch quoted earlier, that "no Branch surrenders any function, duty or power, to the Federal Committee". And it certainly obtained none from the Parent Body. Neither in fact did the Federal Council.

In 1938 when the question of the organization of the profession in Australia was taken up with the Parent Body, the Central Council pointed out that some of the difficulties which confronted the profession in Australia did not arise from any defects in the existing constitution or from lack of autonomy under the constitution, but from the existing lack of power of the Federal Council, inasmuch as it was mainly a coordinating and advisory body, and had failed to obtain adequate powers from the Branches to carry out an executive function.

Apart therefore from taking a new name and becoming incorporated, the Federal Council possessed no greater powers than that "temporary expedient", the Federal Committee.

The British Medical Association Council was quite prepared to grant the Federal Council additional powers, and in fact, in 1938 decided "that the Council take power to vest in Federal Councils powers in all respects similar to those exercisable by the British Medical Association Council". That is, the Central Executive of the British Medical Association was prepared to transfer its executive function in so far as it concerned the profession in Australia to the Federal Council, and thus give the Australian profession full autonomy within the ambit of the British Medical Association.

The outbreak of war interrupted any further negotiations in this regard.

Now the war is over, and the profession in Australia for the third time faces a threat of nationalization—by federal agency—while the nationalization of hospitals, so great a bogey to the profession in 1911, has to all intents and purposes been achieved, with the implementation of the *Hospital Benefits Act*.

Again a time has come when the Australian profession must look to its defences and determine whether, faced

with major problems in the federal sphere, its organization is adequate to the occasion.

Can a group of State Branches, coordinated but not governed by a Federal Council, be an efficient organization, or should some further unification be achieved? I am strongly of the latter opinion.

The nationalization of the medical profession will not be a sudden step, to be merely a matter of acceptance or rejection. Instead the development of a free universal medical service will occur gradually, step by step, and each step must be the subject of careful decision and perhaps much negotiation by a single body acting for the profession.

Alternatives to each step must be ready, and the profession, a generally inarticulate body, must be offered guidance and leadership in its reaction to these successive stages.

There must exist a single body, adequately informed of the professional reaction to the problems it faces, and thereby enabled to enunciate a settled policy, and recognized by the Federal Government as the only body deputed to negotiate and to make decisions on behalf of the medical profession.

What body can do this save an Australian council of the profession?

Such a body must be able to do more than negotiate; it must be able to conclude agreements, knowing that such agreements are binding on all Branches and on all the members thereof. And that is just what the Federal Council at the present time is unable to do.

The transfer to the Federal Council of the control possessed by the Central Council over the Australian Branches would give the Federal Council some executive authority. But some compromise with the Branches might still be necessary. For the Central Council has delegated to these Branches essential disciplinary powers over their members, powers which must be possessed (or at least shared) by an Australian council having governing authority. In this relation Dr. J. G. Hunter has written to me from England as follows: "As the Central Council pointed out in 1938 the question of the Federal Council's powers is entirely one for the Branches, and whatever the Branches decide will be approved here. It is up to us therefore to say what we want." But there would not yet be complete autonomy. The profession in Australia would still be subject to the over-riding authority of the Representative Body. We know that this body by its lack of local knowledge is unable and would never presume to exercise this authority in matters of Australian concern only, and this, as Sir Henry Newland has remarked, constitutes the farcical nature of the present organization. The reference of decisions to England for confirmation, has long since lost any practical importance—agreement is automatic.

The transference of the powers of the Central Council to an Australian Federal body should go a step further and carry with it the complete governance of the Australian profession in matters local to Australia.

Here at last after many years will be achieved that federalization of the profession in Australia hoped for by the founders of the Federal Committee thirty-five years ago. There exists already a prototype of the proposed Australian organization in the constitution of the Medical Association of South Africa.

In South Africa, just as proposed here: (i) The association (till recent months) remained part of the British Medical Association. (ii) The existing branches retained their entity. (iii) The Federal Council was the governing body and the Branches were bound by its decisions. (iv) This Council was constituted on the basis of proportional representation.

During the past year the South African Medical Association has separated itself from the British Medical Association, and constituted itself an independent body affiliated to, but not controlled by, the parent Association.

A modification of the present Federal Council in Australia from its present senatorial representation to one with a delegation more proportionate to the varying State medical populations seems a first essential in the formation of a

body to be trusted with such governing functions. At present 128 members practising in Tasmania have an equal representation to 2,431 in New South Wales. Probably other factors than mere medical numbers need consideration, and it seems proper that some allowance should be made for the size of the States also.

At least in the initial variation from the present equal representation, some balance between groups of States should also be achieved.

The representation which is suggested in the Queensland notice of motion seems to your Council to achieve these purposes best. There is a proportionate balance between New South Wales and Victoria, at least half the States must agree before any majority decisions can be reached, the four smaller States have a combined representation equal to that of the two larger ones together, and Western Australia and Queensland have a little greater than proportionate numbers to allow for their geographical size. Though South Australia has a rather unbalanced representation with two members, to give this State less would destroy the other favourable features of this modification. (See accompanying table.)

TABLE I.

| State.               | Members. | Present Representation. | Proportionate Representation. |                     | Queensland Notice of Motion. Semiproportionate. |
|----------------------|----------|-------------------------|-------------------------------|---------------------|---|
|                      |          |                         | Based on Tasmania = 1.        | Based on 1 per 500. |   |
| New South Wales      | 2,431    | 2                       | 19                            | 5                   | 4   |
| Victoria ..          | 1,847    | 2                       | 15                            | 4                   | 3   |
| Queensland ..        | 642      | 2                       | 5                             | 2                   | 2   |
| South Australia ..   | 506      | 2                       | 4                             | 2                   | 2   |
| Western Australia .. | 311      | 2                       | 3                             | 1                   | 2   |
| Tasmania ..          | 128      | 2                       | 1                             | 1                   | 1   |
| Total ..             | 5,865    | 12                      | 47                            | 15                  | 14  |

The provision for modification every five years saves any anomalies from long perpetuation.

So much for the constitution and powers of the Federal Council.

#### The Policies of the Federal Council.

I would now ask you to consider whether its policies in regard to medical services, as at present enunciated, deserve your support.

Policy in the last resort is not made by a council, but is an expression of the aggregate will of the members it represents. Now it is incredible that, having devoted their life to a certain kind of professional service, the majority of doctors should believe that it is really a service of an entirely different character that would be best for their patients and themselves.

No council then truly expresses the will of its members when it advocates some radical and revolutionary change from the existing order.

The Federal Council has avoided this pitfall, and the first plank of its policy is

That the optimum efficiency of medical service to the people of Australia will be provided by the existing consultant, general practitioner and hospital services with all adjuncts, and some necessary additions, and certain improvements in the social services.

The full list of these additions is too long for publication and is readily available to all members, but it is significant to note here that while some of the improvements are within the power of the profession itself to undertake (extended consultant service, group practice, 24 hour availability, improved post-graduate training), the great majority represent deficiencies in the Government provision of health and social services (improved nutritional and housing standards, extension of preventive medical services, extension of hospital construction and

equipment, improved provisions for care of tuberculosis, *et cetera*).

If the Commonwealth and State Governments would set their hand to providing these various community measures which it is their duty to provide, rather than worry about "free" medical and pharmaceutical services, neither of which will of themselves improve the health of the people or the existing medical services one iota, most of the dissatisfaction with and frustrations of present day medical practice would disappear.

The second plank of Council policy is that the principle of free choice of doctor and patient is an essential feature of any service.

This principle is part of the general conception of liberty, a part of our very mode of life—implying respect for, and the recognition of, individuality. We all know that whatever system denies such free choice, to that extent is the status of both patient and doctor degraded.

The third plank of Council policy is that there is a duty on every individual to accept a moral and social responsibility for his own health and for that of his dependants. This also is part of the concept of liberty. Freedom cannot be retained when a population surrenders to the Government the provision of fundamental needs—in the final resort there is left a population of serfs.

The fourth plank of Council policy lays down that in any general medical service for Australia administration should be in the hands not of a government department but of a corporate body, in which medical men, elected by the practising profession, shall constitute a majority.

This is an essential provision to protect liberty and efficiency. Even medical men who are in government services are insistent that control must be kept away from government departments if efficiency is to be maintained. Every medical man who has had army experience must be equally insistent that the control of a medical service must be divorced from a bureaucracy.

To the extent that governments are willing to correct the defects of present day health services, the Federal Council offers them its strongest support and encouragement. To the extent that governments attempt to destroy the fundamental policies here outlined the Federal Council opposes them.

Clearly much of the present socialist government's programme designed to develop the servile State is opposed to Federal Council policy.

Yet whenever the Council opposes, it is not a pure negative opposition—whenever the government says a certain course is necessary for the public weal, the Council will not oppose it unless it can at the same time show a better way to attain the same objects.

Its attitude in regard to the availability of medical services illustrates this attitude.

The Commonwealth Government has laid down two major items of policy on which its practice will be based. These are: (i) Every person in Australia shall be entitled to medical attention without regard to his economic status and without any direct charge for the service. (ii) This medical service shall include the full range of medical attention, including all modern diagnosis and specialist services. The Federal Council opposes this policy of a free complete medical service financed out of taxation, in the same way as it opposes a compulsory universal system of health insurance, and for the same reasons. To a greater or lesser extent this policy must infringe those doctrines of individual freedom to which the Council gives allegiance. At its best an inefficient civil service obtrudes itself into that doctor-patient relationship into which no third party should enter. At its worst, in the form of that full-time salaried service to which socialists seem devoted it denies to both patient and doctor all those liberties they at present possess. And all this to what gain? Merely that there should be no direct charge for the services. That instead of the present simple contract between patient and doctor, or the well tried management of existing pre-payment, or voluntary insurance services, there should exist an instrument of socialist policy—a freedom-denying collectivist system controlled by an inexperienced and soulless civil service.



If there is a defect in regard to the availability of present services, the Federal Council has a much better policy for correcting it.

A very large proportion of the population are able and willing to accept the financial responsibility for the maintenance of their own health. Though only a minority can face the immediate provision of the cost of serious and unpredictable illness, the use of prepayment systems of finance will allow the majority of the population to secure "that full range of medical attention" envisaged by the Commonwealth Government. There already exist to a partial extent in the case of the friendly societies and to a much greater extent in other voluntary agencies methods by which for a very few shillings weekly—an insignificant sum compared to what the same group spend on tobacco, alcohol and betting, and often also on dental attention—the great body of the population may retain their liberty of action and yet at the same time enjoy the full efficiency of present medical services.

Such systems as Medical Benefits, Limited, of the New South Wales Branch, have the unqualified approval of the Federal Council.

For the indigent and the improvident, a group who are properly regarded as the responsibility of the community, the public hospital system provides all but domiciliary care, and this in the opinion of the Federal Council should be provided by the attachment of such persons to the lists of approved doctors, the premium being borne by the State.

In these ways the Federal Council is confident there can be made financially available to all classes of the community a service much better, because proven by time, than any new government service, and provided in ways that allow the public to retain its freedom and self-respect.

Though the Federal Council opposes for good and sufficient reasons a collectivist system of medical finance, it yet realises that ultimately whether this shall become a reality depends not upon its politically unimportant opinions but upon the will of the people.

Should the people decide to surrender their freedom to the State, and the absolute opposition of the Federal Council becomes futile, its endeavours will then be directed to moulding a "free" service into paths that will best preserve the freedom of the profession, and least reduce the efficiency of the internal content of practice as we know it as present, and as we would like to see it develop in the future.

Already in its attitude to the health service bills that have come before the Federal Parliament it has adopted this latter principle rather than one of general opposition to "free" service. Thus its opposition to the *Pharmaceutical Benefits Act* was determined not on the "free" aspect of the service, but because it infringed a basic freedom of the profession, that of providing whatever medicine seemed best for the patient, without the limitation of any outside agency. So united was the medical profession in opposition to this restriction, that the Act could never have been implemented, even had its validity not been successfully challenged.

In a similar way reaction to the *Hospital Benefits Act* was again centred in its influence on the internal content of medical practice, in this case the continuance of the honorary system. But here the Council faced a problem in which no unified attitude could be determined. Already various modifications of the terms of hospital service had developed in some States, and the Federal Council wisely decided that the attitude of the profession was a matter for individual States rather than federal action. Yet the Council can still exert a valuable coordinating function, in helping the various States to determine proper terms and conditions for whatever service may replace the present honorary system.

And so the policy of the Federal Council will continue in the future. Always maintaining the cause of the most efficient medical service based on the present systems of practice, and championing the utmost freedom for both doctor and patient, it will continue to advocate all those measures, professional and governmental, that make for progress, while opposing resolutely any measures that threaten to diminish its dual aims of liberty and effectiveness.

## Reports of Cases.

### A CASE OF HYDATID DISEASE OF THE THYROID GLAND.

By H. M. SHAW,

Captain, Australian Army Medical Corps.

THE occurrence of a hydatid cyst in the thyroid gland is extremely rare—in fact, only four such cases are reported in the available literature. Sir John Ramsay<sup>(1)</sup> operated on one such case in 1910, but considered at operation that the hydatid might have invaded the thyroid from the pretracheal fascia. Dew,<sup>(2)</sup> in his book on hydatid disease, quoted a case under treatment by Sir Alan Newton. Two cases from New Zealand are reported in the hydatid

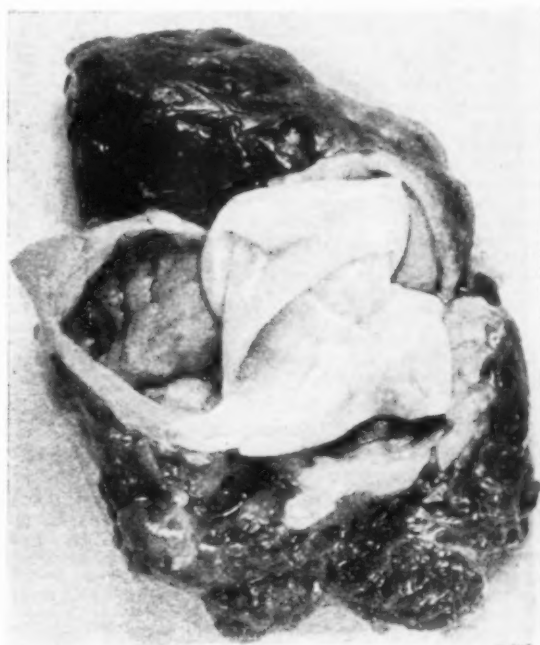


FIGURE 1.

register.<sup>(3)</sup> In each of these cases the original diagnosis was cystadenoma of the thyroid gland, though in one case only was there any evidence of toxicity. The following is a report of a fifth case of thyroid hydatid disease, which has added interest in that there is reason to believe that it was a primary cyst.

#### Clinical Record.

Sergeant V., aged twenty-five years, was admitted to an army hospital in February, 1946, with the history that he had had a swelling in his neck for the past ten years. Over the past two years the swelling had increased, his appetite had been poor and he had lost one and a half stone in weight. He had no other symptoms. Prior to enlistment he had lived in a country district in Tasmania.

Examination revealed the patient to be a healthy-looking young man with an obvious swelling in the neck, to the left of the mid-line. In the left lobe of the thyroid gland there could be felt a single, smooth, semi-fluctuant tumour about one and a half inches in diameter. It appeared to be in the substance of the gland, and moved with it on deglutition. The remainder of the thyroid felt normal. No

other physical abnormality was detected. Apart from the man's loss of weight, which could have been due to his service in the tropics, there were no other signs or symptoms of toxicity. The diagnosis of cystadenoma of the thyroid was made and operation was decided upon.

At operation a left hemithyroidectomy was performed. While the posterior portion of the lobe was being freed the cyst was punctured, a small quantity of colourless fluid escaping. Examination of the specimen revealed a ragged, fibrous-walled cavity about one and a half inches in diameter in the substance of the left lobe of the gland. Lying free inside this was a pearly-white membrane, macroscopically typical of hydatid membrane. No daughter cysts were seen. (See Figure 1.) The surrounding gland substance appeared normal. The wound was closed, and convalescence was uneventful. When examined one month later the patient was very well, his appetite had improved and he had gained one stone in weight.

Because the correct diagnosis in this case was not made until operation, no specific tests were performed beforehand. Post-operatively, however, an attempt was made to exclude the presence of other hydatid cysts. (i) An X-ray examination and fluoroscopic inspection of the patient's chest and diaphragm revealed no abnormality. (ii) The hydatid complement fixation test gave a negative result on two occasions, four days and one month respectively after operation. (iii) The Casoni intradermal test produced an immediate positive response on the first day after operation, while there was no delayed reaction. On two subsequent occasions—the last one month after operation—this test yielded negative results. (iv) A total and differential leucocyte count performed one month after operation gave results within normal limits. (v) The late Dr. R. Wright-Smith's report on the specimen read as follows:

The specimen is a piece of thyroid gland. In the substance of the gland there is a fibrous-walled cavity one and a half by one and a quarter inches in diameter. There is also present a white inner membrane, microscopically laminated and typical of hydatid membrane. No daughter cysts were seen. The surrounding gland appears normal.

#### Discussion.

Arising from this case are some points for discussion.

1. The differential diagnosis. Dew<sup>(1)</sup> states that hydatid cysts are not distinguishable clinically from cystadenoma of the thyroid gland. In the case of hydatid cysts, however, symptoms of thyrotoxicosis are rare. Should the cyst grow to a sufficiently large size, pressure symptoms supervene and may be the reason for the patient's seeking advice. Specific tests are of help in the differential diagnosis.

2. Site of occurrence. The hydatid embryo enters the body by burrowing through the wall of the stomach and the upper part of the small bowel, and is then carried to the liver by the portal blood stream. Here it settles or, entering the central vein of a lobe, it may find its way to the right side of the heart by way of the hepatic veins and the inferior vena cava. Should the embryo succeed in traversing the pulmonary capillaries, it may then settle anywhere in the body. Because of the fineness of the pulmonary and hepatic capillary beds, Dew<sup>(2)</sup> states that 87% of primary hydatid infections occur in one or other of these situations. In this case the negative radiological findings, the negative response to specific tests, and the clinical improvement of the patient give reason to suppose that no other cysts are present. That is to say, the hydatid embryo had traversed the hepatic and pulmonary capillaries and become lodged in an organ supplied by the general systemic circulation.

3. The response to the Casoni and hydatid complement fixation tests. Each of these tests requires for its action the liberation of fluid from the hydatid cyst. In his book Dew<sup>(3)</sup> makes the following observations. Firstly, both of these tests give positive results before operation in 80% to 90% of uncomplicated cases. Both tests may continue to give positive results for a considerable time after operation. Secondly, if the result of the complement fixation test is

still positive seven or eight months after operation, it is evident that other hydatid cysts are present. Lastly, Dew states that the inner laminated membrane is relatively impermeable and that for the hydatid fluid to be absorbed there must be a defect in the membrane.

It has been stated earlier that the hydatid cyst in this case was a single cyst and that no daughter cysts were present. The laminated membrane was intact, and so hydatid fluid containing antigen had not been absorbed. This explains the negative response to the hydatid complement fixation test. The negative results to Casoni tests subsequent to the transient positive reaction obtained on the first day after operation may have been due to the desensitization of the patient produced by fluid spilt at the time of operation. Had this been a secondary hydatid cyst, a positive response to specific tests would be expected consequent upon the rupture of a primary cyst and the liberation of scolices and hydatid fluid.

#### Summary.

A case of hydatid disease of the thyroid gland is described.

Mention is made of the difficulty in diagnosis.

An attempt is made to correlate the unusual features of this case with the more usual pathological findings in hydatid disease.

#### Acknowledgements.

I wish to thank the Director-General of Medical Services, Major-General S. R. Burston, for permission to publish this paper. Thanks are due also to Dr. D. W. Parker for his help, and to the pathologists who carried out the special investigations.

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- <sup>(1)</sup> J. Ramsay: "Unusual Cases of Hydatid Disease", *The Australasian Medical Gazette*, Volume XXXIII, June 21, 1913, page 587.
- <sup>(2)</sup> H. R. Dew: "Hydatid Disease", page 403.
- <sup>(3)</sup> Hydatid Register, Royal Australasian College of Surgeons, Melbourne.
- <sup>(4)</sup> H. R. Dew: "Hydatid Disease", page 404.
- <sup>(5)</sup> H. R. Dew: "Hydatid Disease", page 90.
- <sup>(6)</sup> H. R. Dew: "Hydatid Disease", page 121.

#### SPONTANEOUS RUPTURE OF THE SPLEEN DURING A MALARIAL RIGOR.

By K. R. TORODE,  
Colac, Victoria.

#### Clinical Record.

THE patient was brought to hospital by ambulance at night and admitted with the provisional diagnosis of malaria. He had been discharged from the army three months previously, and had a history of severe dysentery while in the tropics, but had never had an attack of malaria, and six weeks previously he had ceased taking his suppressive dose of "Atebrin". He had been in good health till the day of his admission to hospital, when he had become nauseated and faint, and begun to shiver and had been slightly delirious and had had several loose bowel actions.

On examination, the patient was a well developed male, aged twenty-two years. He was slightly pale. His temperature was 101° F., his pulse rate was 120 per minute and no abnormality was detected in his heart or lungs. Slight epigastric and left hypochondriac tenderness was present; the spleen was thought to be palpable.

In accordance with the usual routine treatment in an unproven case of malaria, and indeed in view of the largely negative history, the patient was placed under observation. On the following day and the succeeding morning he was symptom-free, his temperature and pulse rate were not elevated, and he had walked to the bathroom. About midday he felt nauseated and began to have a mild rigor. A blood smear was examined, with positive result, and 10 grains of quinine were administered orally at 2 p.m. At about 2.30 p.m. he became increasingly pale and uneasy,

and his pulse rate was 120 per minute; the foot of the bed was raised. By 3 p.m. the patient appeared to be entering a state of profound shock, and the intravenous administration of serum was commenced and a small intravenous dose of quinine was given. At this stage he complained of severe pain in the back over the renal angles; the abdomen was lax, and splenic tenderness was present. Blood donors were called, and as soon as possible blood transfusion was substituted for the administration of serum. In the interval the patient had completely collapsed, and by 4 p.m. he was comatose and almost pulseless. A second amount of 600 millilitres of blood was taken from the donors and rapid transfusion was continued; but the patient was completely pulseless and moribund in spite of repeated injections of "Coramine" and adrenaline; at no time did improvement occur. Serum was again substituted while a further donor was called and blood was taken; but by the time this was accomplished it was too late, and the lad died at 8.30 p.m.

In the belief that this patient must have died from a rupture of the spleen superimposed on a severe malarial attack, necessary permission was obtained and a post-mortem examination was carried out. The heart, lungs, alimentary tract and kidneys appeared normal, and the liver was normal also except in appearing slightly larger than average. The peritoneal cavity contained pints of blood clot and serum, obviously originating from the enormously enlarged spleen. The spleen measured approximately twelve by six by four inches, and weighed about four pounds; in its postero-inferior surface was a rupture covering an area of about six square inches.

#### Comment.

This case is reported for the specific purpose of notifying fellow medical practitioners of this unexpected complication of malaria, which may any day worry anyone attending a patient suffering from malaria.

The possibility of certain diagnosis and surgical intervention in this case has been thoroughly debated here, and I believe that it is agreed that in this case everything was against such a course, in view of the lack of—or the confusing nature of—symptoms and the massive degree of hæmorrhage. However, it is not hard to imagine the occurrence of a similar lesion of less severe degree, which might be amenable to treatment by splenectomy, provided one was aware that this complication could occur even in the absence of a protracted malarial history. The question also comes to mind of whether, if this patient had been treated as suffering from malaria and given quinine from the time of his admission to hospital, and if there had been no waiting for proof of the diagnosis, he would have suffered his subsequent fate. The fact that anyone treating malaria may be faced with this problem is the reason for publishing this report.

### HYPOGLYCÆMIC COMA DUE TO ACCIDENTAL INTRAVENOUS ADMINISTRATION OF PROTAMINE ZINC INSULIN.

By D. J. MONK ADAMS,

*Department of Physiology, University of Sydney.*

It is well known that the delayed and prolonged action of protamine zinc insulin is due to subcutaneous depot storage. If the substance is given intravenously, this action is lost and the blood sugar content is reduced with the same rapidity as when ordinary insulin is given. It is possible that the protamine zinc insulin could be administered by intravenous injection accidentally and unnoticed during routine injections. This would seem to be the explanation of the case here reported.

#### Clinical Record.

The patient, aged twenty-six years, has had severe diabetes for eighteen years, and his condition is moderately well controlled on a diet of 1,900 Calories and with separate injections of 46 units of protamine zinc insulin and 14 units of ordinary insulin each morning. On the morning

concerned the patient administered his own insulin to the left forearm at 9 a.m., immediately after breakfast. He felt quite well and normal until 11.55 a.m., when he noticed transitory "blanks" in his right visual fields and began to feel a little vague while crossing a street. He had none of the symptoms of hypoglycæmia to which he was accustomed, such as headache and tingling of the lips and tongue. However, he took 20 grammes of sucrose by mouth and continued on his way. The feeling of vagueness developed into one of confusion, and the visual disturbances became more pronounced. Within four minutes of the onset of symptoms the patient began to stagger, and he felt so weak that he leant against a wall for support. Thereafter he remembers no more; but he fell to the ground and began making a series of clonic movements, which lasted for only two or three minutes before he lapsed into coma. He was taken to the Sydney Hospital at 12.20 p.m., where Dr. Hogan administered by mouth approximately 30 grammes of sucrose dissolved in orange juice; this the patient was able to swallow, although he was somewhat stuporose. Apart from a slight headache and a bitten tongue he had completely recovered by 1.30 p.m. and ate his usual luncheon. His blood sugar content at 3 p.m. was 110 milligrammes *per centum*, and his urine at 6 p.m. gave a yellow Benedict reaction. He ate a normal dinner. During the night, however, the patient awoke twice and passed urine, which gave a red Benedict reaction. This is not customary.

#### Discussion.

In view of (i) the time of onset of symptoms after injection of the insulin, (ii) the rapidity of symptom formation, (iii) the degree of hypoglycæmia, and (iv) the nocturnal hyperglycæmia, it seems justifiable to assume that the morning dose of protamine zinc insulin was given intravenously.

## Reviews.

### GENERAL PHYSIOLOGY.

It is unfortunate when a branch of study at a high level, for example, at university level, becomes too greatly influenced or stultified by what are euphemistically called the needs of professional or vocational "education". Physiology has suffered badly in some ways, because of its key position in medicine, in these days of large medical and dental schools. The term physiology has come to mean too often human physiology. Most undergraduates "graduate" in physiology without realizing the importance of general comparative physiology. It is a truism to state that both medicine and the appreciation of medical research would benefit if in physiological training more emphasis was laid on biological principles and rather less on a very applied study of one particular mammal. Since the publication of "Principles of General Physiology" by W. M. Bayliss in 1914 there have been several good books endeavouring to interpret physiological phenomena in the light of contemporary physics and physical chemistry. The most recent is "Physical Chemistry of Cells and Tissues" by Dr. R. Höber, of the School of Medicine, University of Pennsylvania.<sup>1</sup>

It is a large and ambitious book which will form a standard reference for all interested in the development of biophysics. For future research workers in medical sciences and biology it will be a source of inspiration and thought. It begins with a concise summary of selective principles of physical chemistry by D. I. Hitchcock. This is certainly difficult material, and most readers would be advised to revise their knowledge of these aspects of physical chemistry in some textbook such as "Physical Biochemistry" by H. B. Bull. Then follows a section on large molecules, their physicochemical properties and their architectural and functional significance in living matter by Dr. J. B. Bateman. The next section is by Dr. Höber, and is devoted to a discussion of the surface of the protoplast, its properties and structure. This is mainly an

<sup>1</sup> "Physical Chemistry of Cells and Tissues", by Rudolf Höber, with the collaboration of David I. Hitchcock, J. B. Bateman, David R. Goddard and Wallace O. Fenn; 1945, London: J. and A. Churchill Limited. 9½" x 6", pp. 709, with many illustrations. Price: 42s.



account of the permeability of cells to various substances. It is followed by another section by Dr. Höber, the influence of extracellular factors on cellular activity. The respiration of cells and tissues is discussed by Dr. D. Goddard, who follows the usual lines, but seeks to introduce more thermodynamics than one finds in textbook accounts of this subject.

Dr. W. O. Fenn contributes a very informative and specialized section on contractility of muscles. The long chapter on muscles is a reminder that in spite of the tremendous amount of work done on muscle enzymes, our knowledge of the physiological working of muscle is very incomplete. The last section, written by Dr. Höber, is headed "Passive Penetration and Active Transfer in Animal and Plant Tissues". It deals with intestinal absorption, the formation of urine, permeability of body surfaces and the formation of the digestive juices. This section, which might almost be called the applied section of the book, is most valuable as a statement of the extent to which these well-studied phenomena can be explained accurately by the laws of physical chemistry. There appear to be more deficiencies in those fields than is commonly realized.

Whether the reader be a mechanist or a neo-vitalist in his outlook on biology, this book will give him a new appreciation of the basic problems of general physiology. For the advanced student or research worker, it is well provided with references to key literature. It is a very important book in every way. However, those intending readers who have lost their familiarity with the principles of physical chemistry should have a current textbook of physical chemistry near by.

#### MEDICAL JURISPRUDENCE.

"MEDICAL JURISPRUDENCE", by W. F. Rhodes, I. Gordon and R. Turner, is a compact little volume, now in its second edition, in which, as stated in the foreword, the authors have enumerated and stressed the essentials of the subject.<sup>1</sup>

Most textbooks familiar to students and medical practitioners of this country combine the subjects of medical jurisprudence and toxicology, but in this work toxicology is only very lightly touched upon. This is done deliberately for reasons explained in the preface, but nevertheless it appears to detract from the value of the book for students or busy practitioners.

The early chapters deal with South African law and medical procedure. Then follow chapters dealing with the usual aspects of legal medicine, including a classification of medico-legal deaths based on the production of tissue anoxia. The text proper is compressed into 345 pages and is followed by an appendix containing extracts from the statutes, and medico-legal forms which should prove very useful to South African readers. There is also an excellent series of 77 plates. These are mainly grouped towards the end of the volume.

The subject matter is well set out in a concise and readable manner. Important facts are emphasized and their significance is indicated. In short, the volume can be recommended as a very useful handbook, covering the subject without too much detail and containing a wealth of information, useful particularly to the South African student.

#### DRUG ADDICTION.

In the preface of his book "Narcotics and Drug Addiction" Erich Hesse states: "It appears desirable to make these problems accessible to a wider circle as an added weapon in the fight against drug addiction."<sup>2</sup> This briefly is the thread of continuity running throughout the work.

The book is divided into two sections under the headings "Narcotics" and "Stimulants". The first group includes opium, morphine, cocaine, hashish and such interesting preparations as intoxicating pepper (kava-kava) and intoxicating toadstools.

<sup>1</sup> "Medical Jurisprudence", by W. F. Rhodes, B.A., M.B., Ch.B. (Cantab.), D.P.H. (Oxon.), I. Gordon, M.B., Ch.B. (Cape Town), and R. Turner, M.B., Ch.B., D.P.H. (Cape Town), with additional contributions by M. R. Drennan, G. W. Gale, J. A. Keen, G. J. Key and H. A. Shapiro; foreword by the Honourable Mr. Justice H. S. Van Zijl; Second Edition; 1945. Cape Town: The Post-Graduate Press. 8½" x 5½", with many illustrations. Price: 32s. 6d.

<sup>2</sup> "Narcotics and Drug Addiction", by Erich Hesse, M.D.; translated by Frank Gaynor; 1946. New York: Philosophical Library. 9" x 6", pp. 220. Price: \$3.75.

The portion devoted to stimulants covers alcohol, tobacco, the purine-containing drugs, cola, cocoa and betel nut. The division is rather artificial, as many of these drugs have both actions, but it appears to add to the ease of description. This serves also as a convenient grouping for drugs in common use and classified as stimulants which are not considered socially objectionable by modern western civilization.

The book is chiefly devoted to a study of the pharmacology of these drugs; descriptions are given of their cultivation, extraction and processing, and their biochemical, physical and psychological reactions.

In the history and development of these drugs, mankind has shown amazing ingenuity in finding ever fresh ways and means of varying its perceptions in order to escape from monotony and the fatigue of life. Much of the interest of the book lies in its description of these methods. Throughout the work a constant plea for the control of production and distribution is made, together with a criticism of the vast quantity of money spent on the pleasure-producing drugs. The clinician may be somewhat disappointed if he expects to find details of treatment and specific help in the management of his drug addicts.

The book is published in the United States of America by the Allen Property Custodian under special licence. Most of the extensive bibliography is German, and particular references to legal aspects, not altogether a minor point in this subject, quote the German criminal code. To some extent this is a limitation for the English reader.

The book is very readable and should appeal to all who are in any way interested in the subject. It gives a graphic picture of the extent of drug addiction and an added appreciation of the innate waywardness of human nature.

#### THEORY AND PRACTICE OF NURSING.

"THEORY AND PRACTICE OF NURSING", fifth edition, by M. A. Gullan, S.R.N., is an excellent little volume setting out a summary of the work undertaken during the four years of a nurse's training.<sup>1</sup>

As the author states in her foreword to nurses, probationers may find the summaries somewhat obscure. The book needs to be studied concurrently with the lectures and is admirably suited to be used as a means of revision at frequent intervals during the nurse's course of training.

Certain fundamental principles deserve more attention. For example, in the first chapter dealing with surgical technique, the care of the nurse's hands is dealt with briefly. The student nurse should be taught to care for her hands, both from the point of view of her carrying infection to the patient and of her own protection.

In the chapter dealing with food and the feeding of patients, many good points are made. It is a pity that more stress is not laid on the necessity for the careful charting of fluid intake and output. The student nurse needs to be impressed with the necessity of accurate measuring of the fluid intake and as far as possible of the output, separating the vomitus and urinary output.

The importance of the nurse's own general health when she is nursing patients with infectious diseases, especially tuberculous patients, deserves more attention. In this chapter more reference to immunity, both active and passive, would prove valuable. The chapters dealing with blood supply to the tissues, the pulse and respiration are good, but their value would be greatly enhanced by the addition of suitable diagrams. Indeed the book is remarkable for its paucity in this respect. Only two diagrams are given, and these are not particularly good. The chapter on gynaecology also loses a great deal by the omission of a diagram of the female pelvic organs, which would do much to impress on the mind of the student nurse the danger of ascending pelvic infection.

It is surprising to note the omission of any mention of poisons, even the definition of a poison in the chapter dealing with the administration of drugs, similarly the absence of any reference to the use of sulphonamide drugs in the treatment of respiratory diseases. Notes on private nursing are helpful.

The book is devoted to technique rather than to observation and to the training of the student nurse in the making of her own observations. As an aid to revision it is good. The index, appendices, printing and binding are admirable.

<sup>1</sup> "Theory and Practice of Nursing", by M. A. Gullan, S.R.N.; Fifth Edition; 1946. London: H. K. Lewis and Company Limited. 8½" x 5½", pp. 248, with illustrations. Price: 12s. 6d.

## The Medical Journal of Australia

SATURDAY, SEPTEMBER 21, 1946.

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### NATIONAL FITNESS.

DURING the long days of the war physical fitness was something that was sought by men and women who wanted to put themselves at the service of the country; the need was so great and the tasks were so exacting that only those who were robust in body and vigorous in mind were passed into the ranks. The world of industry, too, had such demands made on it during the war years that those who were not fit were soon discovered and acted as a brake. Physical fitness was discussed in this journal during the war years on several occasions in regard to both its determination and its effectiveness, and industry in general as well as the military machine was the centre of the discussion. Physical fitness was discussed at the first meeting of the National Health and Medical Research Council at Hobart in 1937, when the attention of Australian governments was directed to the serious neglect in adequate supervision of the bodily development of children before and during school age. At the fifth session of the council in 1938 Dr. E. Sydney Morris, Director-General of Public Health of New South Wales, presented a paper on physical education. Subsequently the council adopted a resolution recommending the establishment of a national organization which would have as its main objective "a standard of physical fitness such as this country, with its racial heritages, natural environment and economic opportunities should show". The council further recommended that a National Council for Physical Fitness should be formed at once under the Minister for Health. It stated that while the need for physical education was of most value for pre-school and school groups, it was equally important for adolescent and adult members of the population, and it suggested that immediate steps should be taken to ensure a supply of trained leaders and teachers. In 1939 a National Coordinating Committee for Physical Fitness was formed and held its first meeting; later the name was changed and the committee became the

Commonwealth Council for National Fitness. This title is used in the *National Fitness Act 1941*. The Act states that the "Council shall advise the Minister with respect to the promotion of national fitness, and in particular in relation to (a) the measures to be adopted to develop appreciation of the need for physical fitness; (b) the provision of facilities for instruction in the principles of physical education; (c) the organization of movements, and the provision of facilities, for attaining or maintaining personal physical fitness; and (d) the training of teachers of classes, and of leaders of movements or groups, formed for the purpose of promoting physical fitness". The Act also deals with the creation of a national fitness fund and states how the fund shall be applied.

Since the creation of the National Coordinating Committee for Physical Fitness eight sessions of this body (under its original or later name) have been held, and reports on its activities have been published. The latest document to throw light on the workings of the Commonwealth Council for National Fitness comes from the Parliamentary Joint Committee on Social Security, which devotes its ninth interim report to this subject. The personnel of the Parliamentary Joint Committee has not always been the same. During the second and third sessions of the seventeenth Parliament it has comprised Mr. H. C. Barnard (chairman), Senator W. J. Cooper, Senator H. S. Foll, Senator Dorothy M. Tangney, Mr. F. M. Daley, Mr. L. C. Haylen and Colonel R. S. Ryan. Like all the other reports that have been issued by this committee, the present document is well worth careful study, for it shows an understanding and appreciation of the needs of the situation and an intelligent attempt to do what is necessary. We do not propose to review that section of the report dealing with what has been accomplished by the national fitness movement in the several States, but intend rather to set out some of the observations and recommendations for future action. Perhaps the most arresting statement early in the discussion, and one to which we give ready assent, is that undue stress should not be placed on physical fitness to the exclusion of social development resulting from a wide programme of leisure-time activity of a kind which develops good citizenship. "The real task of the National Fitness Councils is physical education in its widest sense of recreational activities for the community with special reference to youth in building up mental and cultural as well as physical fitness." The common aim of national fitness can best be achieved, the committee thinks, by the development of community centres coupled with the establishment of youth centres, the development of clubs for boys and girls, the provision of playing fields and playgrounds and the encouragement of sports, hiking, camping and other outdoor activities. In this regard we would draw attention to two publications of the Commonwealth Department of Health: "Community Centres", by Kathleen M. Gordon, and "Children's Playgrounds", by B. F. G. Apps; both authors are national fitness officers. The committee wishes to see national fitness as a permanent feature of the social structure. To this end the Commonwealth grant should be continued; if a policy to this end was declared, it is thought that the best type of leader would be attracted to the work. Substantial funds will be needed and certain adjustments in the allocation of the grant are mentioned, but these need not concern

us at the moment. The committee expresses the entirely reasonable view that the headquarters of the national fitness councils in the several States should be the centres of national fitness activity, but this cannot be achieved without adequate accommodation and equipment. In no capital city have the desiderata in these respects been obtained, though Sydney and Perth do provide examples of what can be done. The committee finds that lack of coordination exists between the State national fitness councils, the universities and the education departments; possibly with the advent of trained personnel the lack of drive that is responsible may be remedied. It is worthy of note that in no Australian university are there a properly equipped gymnasium, medical examination room *et cetera* for the sole use of the physical education department. This will have to be remedied if we are ever to see the establishment of a degree course in physical education—one of the aims set by the joint committee. The view is expressed that if an Australian national university is to be established within a reasonable time, this would be the proper place for the establishment of a faculty of physical education.

A word must be added on the committee's suggestions regarding subjects in which research work is urgently needed. Five are named: (i) The growth and development of the Australian child and youth. (ii) Standard achievements for the different age and sex groups. (iii) Effect of different physical activities upon the different age, sex and occupational groups. (iv) Prevention of postural defects during pre-school and early school age. (v) Industrial fatigue and appropriate recreation.

From this short statement it is clear that the Parliamentary Joint Committee on Social Security has put forward suggestions that fall in the domain of preventive medicine. If we can build up a nation of men and women strong and healthy in body and mind, we shall be able to eliminate a great deal of curative medicine. In some enlightened age to come Australian parliamentarians may put first things first. National fitness is one of the first things, and though we may not all agree with all the Parliamentary Joint Committee's aims and recommendations, we must recognize its sound grip of the situation.

### Current Comment.

#### CONCENTRATED HUMAN ALBUMIN IN THE TREATMENT OF SHOCK.

MANY efforts have been made to find an ideal transfusion fluid which will not involve the using of blood, but none have been very successful. The use of fractions of fluid blood, serum or plasma or more concentrated preparations has, of course, been attended with success, and for keeping qualities and ease of administration without need for typing their reputation is already established. The most easily portable, dried plasma, has one drawback, that its reconstitution requires a reliable distilled water, and the expenditure of a little time. Concentrated human albumin seems to be a promising preparation, and a full study of the reactions of normal and shocked subjects to its administration has been made by E. A. Stead, E. S. Brannon, A. J. Merrill and J. V. Warren.<sup>1</sup> The use of this blood fraction has been made possible by the work of Cohn and others, which has provided us with knowledge

of the plasma fractions and given us technical methods of preparation. Other workers have shown that whole blood is superior in the treatment of shock, and in cases of severe blood loss in particular this is generally felt to be true. Nevertheless it is convenient to have a substance which is small of bulk, which stands carriage well, needs no care in immediate preparation, and can be easily administered. The real object of the present research was to investigate thoroughly the effects of the transfusion of concentrated human albumin on the human subject in health, and also in a condition of shock due to injury, loss of blood or other states. The methods used in the inquiry were extraordinarily thorough. The oxygen content of both arterial and venous blood was determined, readings of the atrial blood pressures were taken, respiratory oxygen consumption was estimated, cardiac output was calculated, plasma volume was determined by a dye method, and the haematocrit and protein concentrations were recorded. Incidentally this involves such procedures as arterial puncture and catheterization of the right atrium through the antecubital vein. It will be conceded that a complete set of observations was made. No adverse effects were noted from the experimental procedures. The normal subjects were given a litre of 5% albumin solution by the intravenous route. A rise in the atrial pressure always occurred, but both the haematocrit and haemoglobin readings always fell. No consistent change was found in the cardiac index, which is the output of the heart in relation to the body surface. The results in the case of patients suffering from haemorrhage were uniformly good. The cardiac output rose, the peripheral resistance decreased, some haemodilution occurred, beginning immediately after the transfusion, and the clinical state improved. In the treatment of patients who were dehydrated after burns or infection the results were also satisfactory. With patients who were suffering from wounds of the chest there were certain differences. Here it did not appear that the blood loss was the most significant factor in producing circulatory failure, but good haemodilution followed the injection of the albumin, though less changes were observed in the arterial and venous pressures both before and after treatment. It was found, as has been found before, that a considerable increase over the normal level of the blood volume can be made without the occurrence of a rise in the arterial pressure. One feature of these observations was the total absence of any untoward reactions. A litre of the 5% albumin solution was given to a number of patients in fifteen minutes or less without any trouble at all. In the case of dehydrated patients a 25% solution was used, and this also produced no unpleasant reactions. The authors conclude that human albumin is a satisfactory substitute for plasma. Its small bulk, stability and ease and rapidity of administration make it very suitable for emergency use. It is therefore possible that more use may be made of this recent addition to the whole blood substitutes valuable in the aptly named process of resuscitation.

#### THE INFECTIVITY OF HOMOLOGOUS SERUM JAUNDICE.

THE much discussed problem of homologous serum jaundice has now few important obscurities compared with those existing some years ago. The knowledge that infectious hepatitis is a bowel-borne disease and that it can be transmitted to the human subject experimentally by more than one route has clarified our outlook on this disease, and has also sharpened our interest in its relations with the jaundice produced by the injection of pooled serum. Further, this work has made it possible to isolate and maintain icterogenic agents, so that exact work has been simplified, with the use of that patient rabbit, the human volunteer, to whom some day a memorial should be erected. By this means one of the latest chapters has been written about homologous serum jaundice.

W. Paul Havens, junior, who has been responsible for other valuable work on the subject, now presents a study

<sup>1</sup> Archives of Internal Medicine, May, 1946.



of the period of infectivity of this condition, together with observations on the routes of infection.<sup>1</sup> Whether serum jaundice is really distinct from infective hepatitis or not, or a variant of it, is not clearly known: there are great similarities, but there are also differences, though the existence of the latter does not prove a distinct origin. During the work carried out in Egypt on sandfly fever ieterogenic samples of serum were accidentally discovered. These have been passed through four sets of volunteers, and the agent maintains its characters. Out of 31 human volunteers injected with this serum 14 suffered from the characteristic malady after an incubation period ranging from 56 to 134 days, and they did not prove immune to other laboratory strains of infective hepatitis. In the present experiment serum was collected from the inoculated persons when they were three-fourths through the estimated incubation period, during the first week of the disease when it appeared, and in the convalescent period. Stools were also collected during the first week of the illness, and all the material was stored in an ice box for a period of fourteen to fifteen months. Filtrates from this material were used for inoculating and feeding experiments on other volunteers, and the results were noted. Havens is careful to point out that only a single strain was used in this work, and that therefore deductions must be made with some degree of caution. However, it does appear that some differences exist between the findings in infective hepatitis and homologous serum jaundice produced under these conditions. The differences are in regard to the period of infectivity of the blood, the effective route of transfer of the infection, and the infectivity of the faeces. In no case was it possible to transmit the disease with serum obtained from a patient during the period of convalescence, although serum taken during the incubation period produced the disease in one out of four volunteers. No virus could be demonstrated in the faeces of the patients, even during the time when it was proved to be present in the blood. The ingestion of proved infective serum was also harmless. That the appearance of jaundice in the volunteers after inoculation of the ieterogenic strain of serum was not accidental was proved by passing the disease on to other volunteers with serum collected during the incubation period. It is, of course, abundantly established that passage of this virus can be made repeatedly, but the particular interest in this work lies in its placing on a controlled experimental basis the information already gained in the field of observation.

The importance of this work has already been demonstrated in the preventive sphere. With proper technique serum jaundice should not now be transmitted in hospitals and clinics where contamination of syringes may take place, but it would appear that the risk of transmission by any route other than the parenteral is negligible or absent. However, further work should make sure of this point, and more knowledge is hoped for concerning this most interesting subject. Its study first began in connexion with preventive inoculation for yellow fever and the use of convalescent serum in other infectious diseases, but now there are probably few concerned with medicine who would not be keen to learn more about it.

#### THE EFFECT OF PARENTERAL FLUID ADMINISTRATION ON PULMONARY CONDITIONS.

NEARLY three years ago occurred the lamentable Cocoanut Grove disaster in Boston in which large numbers of people lost their lives and many others were seriously burned. Fortunately the victims were promptly treated, and undoubtedly many recovered who might otherwise have died had not courageous and sometimes drastic measures been taken. The amounts of plasma and other fluids given parenterally may have seemed somewhat heroic to the more timid reading the accounts, though there can be no

doubt that what seemed large dosage in some cases was merely within the bounds of physiological requirements. Details of these cases have been written in full in various places, and the causes of death and autopsy findings have also been the subject of articles in the medical literature. A study has just appeared on an interesting aspect, that is, the possible effect of high dosage of plasma and other fluids administered intravenously on the pulmonary complications from which many of the patients suffered. M. Finland, C. S. Davidson and S. M. Levenson, who present this study, remark that few reports exist dealing with the problems related to the combination of extensive burns and severe injuries of the respiratory tract.<sup>2</sup> It was a notable feature of these cases that respiratory complications were common and severe. The exact cause for this has been argued. It has been suggested that an irritant such as phosgene might have been responsible, arising from the exposure to hot surfaces of refrigerant gas from the air-conditioning plant. Though this was possible, it was rejected after a study of the conditions, for it seemed more likely that exposure to the ordinary gases and fumes produced by incomplete combustion of hangings and fittings would readily cause the respiratory signs and symptoms. Indeed in many of the fatal cases the whole of the upper air passages were found thickly lined with a sooty exudate. In those who survived, at any rate long enough for adequate studies to be made, the findings were consistent with a severe inflammation of the larynx, pharynx and bronchial tree, causing obstruction, with scattered areas of atelectasis and emphysema. But whatever the cause or causes of these severe complications, the point at issue in the present inquiry is whether the administration of a relatively large amount of fluid directly into the circulation could have done any harm. Was there any degree of pulmonary oedema that might be ascribed to this cause, and if so, was it unwise to run the risk of producing it in the presence of damage to the lungs? Several grades of lung injury were noted. In some patients there were no respiratory signs at all. In others only slight involvement of the upper air passages occurred. But there was definite evidence of pulmonary consolidation in some of the burnt patients, accompanied by stridor and cyanosis, while the degree of obstruction was so great in others that tracheotomy was necessary. Though there was fairly close correspondence between the severity of the burns and that of the respiratory involvement, this was not always so. In a few cases even fatal respiratory lesions were observed in persons who were not burnt at all. This is not difficult to understand, as the exact circumstances would vary considerably. The authors face the question of the possible effects of injecting large amounts of fluid into these patients with greatly damaged respiratory tracts. During the early hours of emergency treatment, saline solutions were administered in some cases while additional supplies of plasma were awaited. But it was not in these early hours that symptoms suggesting pulmonary oedema were observed. Scattered moist signs were heard in the chests of many patients, and the moribund often presented the common sight of frothy fluid exuding from the air passages. Certainly there were often signs of increased venous pressure, but it seems reasonable to attribute that to the obstruction present to free breathing through the air passages. Details of the fluid balance charts of 92 survivors and 39 persons who died are recorded. The survivors received the equivalent of 1,850 cubic centimetres of plasma, and the amounts were not substantially different in those who did not survive. More relevant is the study of individual patients who received large quantities of fluid, but who had burns only of slight degree, though there were also pulmonary symptoms. No evidence of any harmful symptoms or signs in the respiratory system was found. Finland and his associates conclude that heroic parenteral administration of fluids did no harm even in the presence of severe pulmonary damage. At least this experience seems to show that where injuries like burns demand the use of extensive fluid replacement, the possible coexistence of pulmonary involvement is not a contraindication.

<sup>1</sup> *The Journal of Experimental Medicine*, June, 1946.

<sup>2</sup> *Archives of Internal Medicine*, May, 1946.

## Abstracts from Medical Literature.

### MEDICINE.

#### Poliomyelitis.

W. I. FISHBEIN, A. E. CASEY AND H. M. HUNDESEN (*The Journal of the American Medical Association*, December 22, 1945) have reported an investigation into the transmission of poliomyelitis by patient to patient contact. It had been established that the infectious period in the cases studied in 1941 was three days before and three days after the onset of the prodromal period, and the incubation period (from exposure to the onset of the prodromal period) was four to thirty-five days, averaging twelve. In this study when a case of poliomyelitis or suspected poliomyelitis was reported in Chicago, a careful history was taken and a careful investigation of the patient's neighbourhood was made, including a study of all possible contacts. When contacts had any symptoms of a febrile illness at all, they were fully investigated and the spinal fluid was tested. Seven paralytic patients and their neighbourhoods were studied. Among 224 non-contacts or controls no case of poliomyelitis developed. Among 66 contacts, 24 developed poliomyelitis, and 13 developed febrile illnesses compatible with poliomyelitis. In this study contacts were persons under twenty-five years of age who had spent at least ten minutes in the company of the poliomyelitis patient during the three days before and three days after the onset of the prodromal period, that is, the infectious period. Spinal fluid tests made from two to seven weeks after contact yielded 45 milligrammes of protein or more in 22 out of 23 children among the contacts. There was no evidence that flies on food or other factors played any part in the transfer of the disease. The authors record that in this investigation multiple cases in the family were the rule when there were other children from one and a half to eight and a half years of age in the house. Between one and a half and three and a half years of age poliomyelitis appeared to be contagious to a degree of 90%. Many of the cases were very mild, and would not have been diagnosed without an intensive study. It is apparent that previous opinions on the infectivity of poliomyelitis should be revised.

#### Pneumothorax.

J. E. LEACH (*Archives of Internal Medicine*, November-December, 1945) discusses spontaneous pneumothorax in young adult males. One hundred and twenty-six patients were studied among military personnel. The onset was gradual in 23 cases, sudden in 90, and in eight cases there were no symptoms. In 50 cases the onset occurred while the patient was at rest, in 39 during mild exertion, and in 14 during violent exertion. In 26 cases the mode of onset was stated, and in four the condition was discovered on routine X-ray examination. Of pneumothoraces, 60% were on the right side. The degree of pulmonary collapse varied greatly. In half the patients it was less than 33%. The cause of the pneumothorax was not

determined in 107 cases. It was due to proved pulmonary tuberculosis in one case, emphysema in one, pneumonia in one and pleurisy in one; it was post-operative in one case. Emphysematous blebs could not be demonstrated radiologically. Complications were rare. Slow expansion of the lungs, hæmorrhage, pneumonia, increase in degree of pneumothorax, and thoracentesis for excessive pain or dyspnoea were recorded. The period elapsing before complete expansion of the lung averaged thirty days. The patients were military personnel; 93 returned to duty. Five patients had a recurrence. In flying personnel there was no evidence that pneumothorax resulted from flying, nor from the use of the low-pressure chamber. This series of cases in healthy young males, who had been subjected to X-ray examination prior to their joining the services to exclude tuberculosis, shows a very high proportion of cases in which the cause could not be found. The recovery rate was also high.

#### Gonorrhœa Cured with a Single Subcutaneous Injection.

T. R. LLOYD JONES *et alii* (*The Lancet*, April 13, 1946) describe a new vehicle for prolonging the action of penicillin, consisting of magnesium sulphate monohydrate in peanut oil. Penicillin was demonstrated in the serum of eight out of eleven patients twenty-four hours after they had received a single injection of 250,000 units suspended in this vehicle. A subcutaneous injection of this amount cured 108 out of 113 patients suffering from gonorrhœa.

#### Penicillin for Infected Pleural Effusions.

L. FATTI, M. E. FLOREY *et alii* (*The Lancet*, March 2, 1946) describe methods for the use of penicillin in the treatment of acute infections of the pleura, which in their hands in twenty cases greatly reduced the expected duration of the illness. The method consists first of the aspiration of the fluid and the injection of 240,000 units of penicillin (or 2,000 units per pound of body weight in children under five years) in 20 millilitres of saline solution. The injection is made without waiting for the result of the bacteriological examination of the fluid, but if this indicates that the fluid is infected with microbes sensitive to penicillin, the treatment is repeated every second day till the effusion is purulent. An intercostal drain is then inserted by means of a trocar and cannula, in such a way that the insertion shall be as airtight as possible. Care is taken to prevent air from entering the chest during subsequent manoeuvres. Installations of penicillin solutions are made through the tube twice daily: the solution contains 500 units per millilitre of penicillin and the amount is equal to half the quantity of the discharge that has drained from the chest or 20 millilitres, whichever is the less. Where the infection is staphylococcal, however, 60,000 units are instilled twice daily (or 500 units per pound of body weight in children under five years). Drainage is set up twice a day by connexion with an underwater system an hour before each instillation. Usually, unless the tube has become blocked, the whole amount that drains is expelled in ten minutes. Dis-

continuation of drainage and instillation is indicated when the pus has disappeared and the discharge is serous or only slightly turbid and watery. A dry dressing is then fixed firmly over the mouth of the sinus and left alone for five to seven days, by which time the wound should be dry.

#### Octyl Nitrite in Achalasia of the Cardia.

T. ROBSON AND R. S. WILKINSON (*The Lancet*, May 18, 1946) administered octyl nitrite (dispensed in capsules containing three minims) by inhalation to a young girl suffering from achalasia of the cardia. The drug was at first very effective, but after three weeks was no longer so. In another patient, aged thirty-two years, under the care of B. E. Thompson, no sign of any lessening of the effect of octyl nitrite was observed after six weeks' treatment.

#### A New Hæmatopoietic for Sprue and Pernicious Anæmia.

T. D. SPIES *et alii* (*The Lancet*, June 15, 1946) have shown that the synthetic compound, 5-methyl uracil or thymine, is an effective hæmatopoietic substance against the macrocytic anæmia of tropical sprue, as well as against that of pernicious anæmia as they had previously observed. The response to the drug was parallel with that which followed the administration of synthetic folic acid. In the four patients with tropical sprue who were treated with the thymine, reticulocytosis began on the fourth or fifth day and reached its peak on the eighth or ninth day. Appetite and strength increased, glossitis and soreness of the tongue disappeared and the stools became less abnormal as early as the fourth day of treatment.

#### Results in the Treatment of Subacute Bacterial Endocarditis.

LOUIS LEVY AND NED MCKRILL (*Archives of Internal Medicine*, April, 1946) present results in the treatment of subacute bacterial endocarditis based on a review of eleven cases of this disease. The recent literature on the therapy of subacute bacterial endocarditis is briefly summarized, and the authors state that, till the advent of penicillin as a therapeutic agent as first reported in a series of cases by Loewe and others in January, 1944, the results of treatment were very unsatisfactory. The authors treated some of their patients with penicillin, heparin and sulphadiazine, and others with penicillin alone. Seven of the eleven patients are considered as probably cured, one died from a heparin reaction and three failed to recover. Two additional patients from whom no cultures of microorganisms could be obtained were successfully treated for subacute bacterial endocarditis with penicillin, heparin and sulphadiazine. The authors have formed the opinion that heparinization favours the fragmentation of the vegetations, leading to embolism, and that large cerebral hæmorrhages are due to bleeding into infarcted areas as a result of diminished coagulability of the blood. Another danger attendant upon the use of heparin is a reaction due to sensitivity to heparin. The authors advise the use of heparin only in those cases in which the disease has failed to undergo remission with one course of penicillin

therapy. However, it is admitted that the final evaluation of the part heparin will play in the treatment of this disease will not be made until comparable series of large numbers of cases with and without the use of heparin are reported. The results with penicillin therapy indicate the first real advance that has been made towards the conquering of a disease which previously had a mortality rate close to 100%. Penicillin is by far the most effective agent existing for the treatment of subacute bacterial endocarditis; but indications are that success will be attained only by prolonged administration of large doses of the drug. At least 200,000 units a day for one month seems to be the optimal minimal dose in most cases, and this dose should be increased if prompt remission is not induced. The authors are of opinion that at present intramuscular administration at intervals of two hours is the method of choice when therapy is to be continued for so long. They make a plea for early diagnosis of this disease, with early institution of treatment with adequate amounts of penicillin continued for a satisfactory period. Further, after a patient recovers from an episode of subacute bacterial endocarditis, he should have a careful follow-up study and be examined at least once a month for the first year. Foci of infection should be thoroughly investigated and if necessary eradicated. Any dental or operative procedure should be preceded and followed by the use of penicillin as recommended by numerous other authors.

#### Scarlet Fever.

PAUL ASHLEY (*The Journal of the American Medical Association*, March 23, 1946) discusses the treatment of scarlet fever. During an epidemic in the United States of America, 50% to 60% of the cases of scarlet fever were caused by group A  $\beta$ -hemolytic streptococci, types III, XVII and XIX. These three types were sulphonamide-resistant in laboratory tests. In treatment the intravenous injection of ten millilitres of streptococcal antiserum did not give such good results as the intravenous injection of fifty millilitres of convalescent human scarlet fever serum prepared within a week of its administration. Another series of patients were given penicillin in addition to fifty millilitres of pooled human convalescent serum. In these last cases the results were said to be much better than with the other methods of treatment, particularly in the absence of complications. The comparison between the patients treated with streptococcal antiserum and those treated with human convalescent serum was not satisfactory, as the toxæmia of the disease was more pronounced in one group than in the other.

#### Streptococcus Carriers.

M. HAMBURGER AND H. M. LEMON (*The Journal of the American Medical Association*, March 30, 1946) discuss the problem of dangerous carriers of hemolytic streptococci. Studies were made in several army units in the United States of America in which epidemics of infections with hemolytic streptococci occurred. Twenty-six carriers were given one gramme of sulphadiazine daily for ten days. In these patients the nose cultures no longer contained streptococci, but when

the drug was suspended the streptococci again became prevalent in 95% of the carriers. Fourteen carriers were given 300,000 units of calcium penicillin in beeswax peanut oil, one millilitre daily by intramuscular injection for five to seven days. Both nose and throat were promptly freed of streptococci in half of these carriers. In the other half the streptococci were eliminated or much reduced during the treatment, but recurred after treatment was suspended. In these cases the carriers dispersed very few streptococci into their environment after penicillin administration.

#### Primary Atypical Pneumonia.

JOSEPH F. PAINTON, ALFRED M. HICKS AND SAMUEL HAUTMAN (*Annals of Internal Medicine*, May, 1946) present a clinical analysis of primary atypical pneumonia with a discussion of electrocardiographic findings based on a study of 321 patients. The disease was found to occur throughout the year, with the greatest incidence in the winter months. The onset was gradual, and a non-productive cough and fever were found to be the outstanding symptoms. Crackling râles over the involved area and some degree of pharyngitis were present in two-thirds of the cases. Inspiratory wheezes heard over the affected area provided an important diagnostic sign early in the disease. The pulse and respiratory rates were only moderately elevated in most of the cases, and a normal blood picture was the usual finding; but a leucocytosis did not preclude the diagnosis. The blood sedimentation rate as a rule was moderately elevated, and proved a useful adjunct in determining the time of discharge of the patient from hospital. The more common lung areas found to be involved in the atypical pneumonic process were the hilar areas, with extension into the dependent portions of the lungs. The cardiophrenic angles were the chief site of involvement in nearly half of the series, and the left lung was more frequently affected than the right. Treatment was chiefly symptomatic, but sulphonamides were indicated in selected cases. Complications were infrequent. In a small number of cases (3.7%) changes were found in the RS-T segments and T waves, or conduction disturbances in the electrocardiogram which were suggestive of pericarditis and myocarditis, and most of these graphic changes were found to be reversible.

#### Blood Plasma Proteins in Patients with Heart Failure.

GEORGE R. HERRMANN (*Annals of Internal Medicine*, May, 1946) discusses blood plasma proteins in patients with heart failure, and reports the result of a study of blood plasma proteins in 100 oedematous patients with congestive heart failure. The role of low blood plasma protein levels, particularly low serum albumin level, in relation to oedema formation in patients with congestive heart failure was investigated. Slight but definite subnormal albumin level with slight compensatory increases in globulin values were observed. It was also found that after the clearance of the oedema, the blood proteins did not immediately rise to normal levels, but there were gradual accretions. The author suggests that this lag may be due to, and evidence

of, liver dysfunction. Time is required after diuresis and reestablishment of circulatory equilibrium for liver function to be restored and normal protein anabolism to become effective. The lowest blood protein levels were noted in patients who had had congestive failure for many months, and especially in those who developed evidence of cirrhosis of the liver. Irreversible cirrhosis results in still lower blood serum albumin values. It is thought that the giving of diets rich in protein, acid or neutral ash, and free from sodium, is indicated for most patients with congestive heart failure and oedema. Proteins of good biological character may be supplemented with protein hydrolysates, amino acids, yeast or choline.

#### Dermatoses of the Hands.

C. G. LANE, E. M. ROCHWOOD, C. S. SAWYER AND I. H. BLANK (*The Journal of the American Medical Association*, August 4, 1945) discuss dermatoses of the hands. Eczematoid dermatoses which begin on the hands and remain limited to the hands and lower part of the forearms form 10% of all cutaneous disturbances. These hand rashes have been attributed to many different causes and have been given many different names. The authors studied 475 patients affected by these rashes. There was a great variation in the type, arrangement, distribution and extent of these lesions. Vesicles, erythema, papules and fissures were noted. Relapses and remissions were frequent. In only one case was a filamentous fungus found in the scales of the lesions on the hands, but fungous infections of the feet occurred coincidentally in some cases. The hand lesions yielded a true culture of *Staphylococcus aureus* in a large percentage of cases. Patch tests rarely indicated that the lesions were due to soap, though some patients showed varying degrees of irritability. Over half the patients had their hands in frequent contact with water and soap or some other alkali. Specific acquired sensitivity due to occupation did occur, but such cases were not included in this series. In any case there was a tendency to accept this diagnosis too readily. The use of excess of soap and water aggravated the lesions in many cases. Emotional strain and infections elsewhere also caused exacerbations, but the *Staphylococcus aureus* was the commonest aggravating factor. Treatment comprised the use of boric acid soaps and compresses and the use of boric acid ointment or Lassar's paste during the dry fissured desquamating phase. Soap was avoided when possible. Local treatment with bactericidal or bacteriostatic agents and the use of sulphonamides were usually ineffective, nor did treatment for the general health affect the lesions to any extent.

#### Tuberculin Patch and Jelly Tests.

E. H. W. DEANE (*The Lancet*, February 2, 1946) found that the potency of a widely used variety of tuberculin patch for the "patch test" diminished fairly rapidly with the passage of time, so that there were proportionately about five times as many reactors to freshly prepared patches as to patches eleven months old. The author describes a cutaneous test made with tuberculin jelly, which he claims to be as reliable as the Mantoux test.



## Medical Societies.

### OBSTETRIC STAFF OF THE WOMEN'S HOSPITAL, MELBOURNE.

A MEETING of the obstetric staff of the Women's Hospital, Melbourne, was held on March 20, 1946, PROFESSOR R. MARSHALL ALLAN in the chair. The meeting took the form of a discussion on *placenta prævia*.

#### Placenta Prævia.

DR. W. D. SALTU gave a general survey of *placenta prævia*. He said that *placenta prævia* was an obstetric complication which, although fortunately not common, was of such serious import that it was essential to have a clear conception of its diagnosis and a still clearer conception of its treatment. Thus the obstetric staff considered it an appropriate subject to introduce at one of its quarterly meetings. Knowledge concerning the abnormality might be said to date from the end of the seventeenth century and the beginning of the eighteenth century. Portal, in 1685, and Schacher, in 1709, accurately described the condition from a clinical and an anatomical point of view. Very little advance was made in knowledge concerning it until Barnes advanced his views on its mode of production and on the methods of controlling the hæmorrhage arising from it. Since then many investigators had busied themselves in determining its ætiology and the most suitable treatment.

Dr. Saltu went on to say that although sometimes *placenta prævia* was encountered before the twenty-eighth week of pregnancy, for clinical purposes the condition was not regarded as a distinct entity until pregnancy had advanced to the period of viability of the fœtus. The nomenclature in regard to the differentiation of types had led to some confusion. The commonly accepted varieties were three: (i) the central type, in which the placenta completely covered the internal os; (ii) the marginal type, in which the placenta encroached more or less upon the internal os but did not cover it; (iii) the lateral type, in which the rim of the placenta encroached on the dilating zone, but did not overlap the internal os. Occasionally the term "lateral" was applied to the type in which the placenta overlapped the internal os. The classification into varying degrees of *placenta prævia*, such as complete and partial, was not of much help. The central variety had been described as a *placenta prævia* covering an internal os dilated to admit two fingers; but there again it was possible that if the patient was examined, perhaps when the os was half-dilated, the edge of the placenta would be easily palpable. So estimation of the degree of *placenta prævia* was purely relative. In performing a vaginal examination on these patients at the stage of one or two fingers' dilation of the os, one could not afford to be too inquisitive in feeling for a placental edge, and as a result some of the so-called central types of *placenta prævia* diagnosed as such and treated accordingly were in reality the marginal type.

Discussing ætiology of *placenta prævia*, Dr. Saltu said that comparatively little was known. The condition was much more common in *multiparæ* than in the *primigravida*. Three explanations had been put forward: (i) the influence of gravity, (ii) overgrowth of the placenta, (iii) reflexal placenta. With regard to gravity, the impregnated ovum might descend into the uterine cavity until it reached a point favourable to its development. As the mucosa of the lower uterine segment participated in the decidual reaction to pregnancy, it was reasonable to assume that the ovum might not become arrested until it reached the dependent uterine zone. While this readily explained in theory a cause of low implantation, it did not account for the fact that the placenta might cover the internal os. However, if the placenta reached the rim of the os, the decidua might split, being crowded over the os and beyond, and permitting the placenta to become adherent to the other side. With regard to overgrowth of the placenta, Strassman had contended that *placenta prævia* was due to defective vascularization of the decidua, possibly associated with some pathological condition in the uterus. When the implantation took place near the lower segment, the placenta could not obtain sufficient nutriment from the vessels within its site, so spread out to acquire the necessary blood supply. Why the placenta should not spread upwards into the upper segment, where ideal conditions for its growth were present, had not been satisfactorily explained. There was corroborative evidence of this theory in the fact that placenta normally placed, which were thick and highly vascular, had a relatively small

area of attachment, whereas thin placenta had a large area of attachment. It was frequently found that the placenta in cases of *placenta prævia* was large and thin and varied considerably from the normal shape. With regard to the reflexal placenta theory of causation, Hofmeier and Kaltenbach, in 1888, had advanced the theory that a part of the placenta developed from a portion of chorion in contact with the decidua reflexa. Normally the villi of this particular part of the chorion atrophied. As pregnancy advanced, this so-called reflexal placenta gradually bridged over the internal os and eventually came into contact and fused with the decidua vera, after which vascular connexion with the uterine wall became established.

Referring to symptoms and diagnosis, Dr. Saltu said that the outstanding characteristic was painless hæmorrhage commencing within the last twelve weeks of pregnancy. The hæmorrhage came on suddenly without warning and without any apparent cause. In some cases hæmorrhage and miscarriage occurred before the period of viability; but the typical onset was about six to eight weeks before term. The hæmorrhage came on without any warning. The patient had been in previous good health and had not felt ill. The initial hæmorrhage was of variable severity—ten to twenty ounces of blood might be lost, or the hæmorrhage might be only slight. *Placenta prævia* was a treacherous malady. The first hæmorrhage might produce profound anaemia and necessitate urgent treatment. More usually the moderate or slight hæmorrhage ceased and might not recur for a few days or even for two or three weeks. These recurrent attacks of hæmorrhage might be slight or severe. As the hæmorrhage was coming from the sinuses in the lower uterine segment, it followed that the hæmorrhage was always external and never internal, as in accidental hæmorrhage. In cases of uterine hæmorrhage during the last trimester of pregnancy, the diagnosis generally rested between *placenta prævia* and hæmorrhage from a normally situated placental site or accidental hæmorrhage. One had to exclude the rarer causes, such as carcinoma of the cervix, a cervical polypus and vaginal varices. Discussing the differentiation between *placenta prævia* and accidental hæmorrhage, Dr. Saltu said that this was generally possible, although a mild accidental hæmorrhage of the revealed type unassociated with pain might lead to confusion, especially when the cervix was closed. However, most cases of accidental hæmorrhage were associated with a variable amount of pain, and the hæmorrhage of *placenta prævia* was painless. Some confusion might arise over the patient suffering from *placenta prævia* who was in early labour. However, if the patient was exsanguinated, examination of the abdomen would generally clinch the diagnosis. One noticed that the abdomen was not resistant, that the uterus was soft, that there was no tenderness, and that the fetal parts could be felt as normally. Moreover, the fetal heart was generally audible. In contradistinction to these findings, in accidental hæmorrhage, particularly in the more severe types, there was pronounced tenderness of the abdomen. The tender uterus was of wooden consistency, there was difficulty in making out fetal parts, partly owing to muscular rigidity, partly owing to the presence of clot in the uterus, and generally no fetal heart could be heard. Furthermore it was observed that the presenting part, if a vertex, was riding high out of the pelvis and could not be pushed down. Commonly malpresentation was present, such as a breech or transverse presentation. Vaginal examination would frequently confirm the diagnosis. If the internal os was open, as was usually the case when there was much hæmorrhage, the placenta could be recognized as such, wholly or in part, covering the internal os. It was possible to confuse placenta with clot. The placenta was tough, whereas clot broke down readily under a little pressure from the examining finger. One recognized the abdominal resistance in the vaginal fornices and the high presenting part. The closed cervix, particularly in the earlier cases of *placenta prævia*, sometimes presented a little difficulty. The feeling of boggy in the fornices, said to be characteristic, could be confused with a collection of clot from an accidental hæmorrhage. Similarly, the recognition of pulsation in the fornices was unreliable, so one had occasionally to fall back on the history and the abdominal signs. The examination of the urine, too, was a help, as it was known that about 60% to 70% of cases of accidental hæmorrhage were toxæmic in nature, and albumin in varying amounts appeared in the urine. The presence of albuminuria in itself was not conclusive, as toxæmia could be complicated by *placenta prævia*. Dr. Saltu recalled a patient sent into the hospital some years earlier. She had a severe grade of albuminuria, and her doctor after a few days' treatment in a private hospital decided rightly that her pregnancy should

be terminated. The attempted introduction of a rectal tube produced copious hæmorrhage, which turned out to be due to an unsuspected *placenta prævia*. Dr. Saltau said that on occasions radiology had been used in an attempt to localize the placental site in suspected cases of *placenta prævia*; Dr. Colin Macdonald was present to give his opinion on its value and his description of the various techniques involved.

Dr. Saltau went on to say that the prognosis in *placenta prævia* should always be guarded. Even when a mother was in good condition and hæmorrhage had been slight, one never knew when the hæmorrhage might become profuse and her life be placed in immediate jeopardy. Then there were the ever-possible sequelæ which might mar a successful delivery. Procrastination might spell disaster, although delay might be possible in a hospital thoroughly equipped for abnormal obstetric cases with a personnel trained to manage cases of hæmorrhage. One of the most important factors in determining prognosis was the degree of *placenta prævia*. The high lateral type was usually accompanied by a lower maternal mortality than the others, although a considerable risk to the child remained. As a general rule, the more the placenta encroached on the internal os, the greater was the danger to mother and child. Apart from the direct results of hæmorrhage, another cause of maternal death was post-partum hæmorrhage due to an adherent placenta, also to the inefficient retraction of the muscle of the lower segment. In the absence of indications for Cæsarean section, the prognosis was worse for *primigravida* than for *multipara*, owing to the increased difficulty of vaginal manipulation in the former. Probably breech presentations were more favourable, as less manipulation was needed to bring down a leg. One had to remember that all internal manipulations were fraught with danger, as the lower segment was friable and extensive laceration might occur. Then there was the danger of infection. Until the early part of this century it had been said that 40% of *placenta prævia* patients died from this cause. However, with the advent of modern ideas on the bacteriology of sepsis and its treatment, with the improved technique and availability of blood transfusions, with the sulphonamide drugs and more recently with penicillin, infection had lost some of its terrors. The infants frequently died as a result of prematurity, and they might succumb to intrauterine asphyxia, or if the placenta was badly torn and if the tear was associated with an abnormal insertion of the cord, they might be destroyed by anaemia. Every effort should be made to save both patients; but it was a small triumph to save the baby at the expense of the mother. It had been said that he who would save the most babies would lose the most mothers.

Discussing management and treatment, Dr. Saltau said that fortunately there were rational and certain methods of treatment for this most serious accident of pregnancy. Many factors had to be taken into consideration in deciding on treatment in the individual case: the surroundings of the patient, as she might be examined at home after the first attack of hæmorrhage, the condition of the mother (depending on the amount of blood lost), the age of the fetus (as it was generally alive in cases of *placenta prævia*), and the type of *placenta prævia*, whether total or partial. Then there was the question whether the patient was in labour or not, and also the degree of dilatation of the cervix. There were various methods of treatment *per vaginam*, by which direct pressure and control could be exerted over the bleeding sinuses in the placental site; this differed from accidental hæmorrhage, in which one had to rely on indirect means of controlling the hæmorrhage. Fortunately most of these methods in varying degree tended to initiate labour and terminate the pregnancy. Unfortunately some of them, on account of the necessary manipulation, were associated with a certain amount of trauma and shock, which added to the gravity of the condition for the exsanguinated patient, and with most of them the outlook for the baby was extremely problematical. The following methods of treatment were available: (i) watchful expectancy; (ii) vaginal packing; (iii) rupture of the membranes; (iv) the use of the hydrostatic bag; (v) Braxton Hick's version; (vi) the application of Willett's clamp; (vii) internal version supplementing the use of the vaginal pack or bag, or possibly with labour well advanced; (viii) Cæsarean section.

Dr. Saltau then asked how far one was justified in pursuing a policy of watchful expectancy in cases of *placenta prævia*. He said that the first hæmorrhage was usually slight, except, of course, the sudden profuse hæmorrhage that came "like a bolt from the blue". If the first hæmorrhage was of this nature, then one had no option but to institute active treatment. But how was one to manage the patient with what might be termed the suspected *placenta*

*prævia*? Whitridge Williams had stated that on account of the danger of profuse and unexpected hæmorrhage, pregnancy or labour as the case might be should be terminated in the most conservative manner as soon as possible after *placenta prævia* had been positively diagnosed. On the other hand, at a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine, as late as November 16, 1945, Dr. Leonard Phillips, of the staff of Queen Charlotte's Hospital, had stated an opposite view. He had said that, looking back on the series of cases of *placenta prævia*—143 in number—which he had surveyed, he saw that he had made a number of mistakes. He no longer treated these cases as emergencies. He left the patients alone, and waited until hæmorrhage occurred and dealt with them along the lines he had indicated.

Dr. Saltau went on to say that it was probably appropriate at this stage to detail the routine method of treatment now adopted at this hospital when a patient was admitted with a history of ante-partum hæmorrhage or existing hæmorrhage. No vaginal examination was made. A specimen of urine was obtained to help in the differential diagnosis from accidental hæmorrhage, and the patient's blood was typed. Unless hæmorrhage continued, she was put to bed in the observation ward and perhaps given morphine as a sedative. If hæmorrhage continued or recommenced, then perforce a vaginal examination was made to confirm the diagnosis if possible, to determine the condition of the cervix, and ultimately to decide the type of treatment. In the absence of any further hæmorrhage, if the patient was still six to eight weeks short of term, he saw no reason why expectant treatment could not be adopted. The patient was under expert observation, treatment could be readily instituted at short notice, and with the ready availability of blood, transfusion could be commenced within a few minutes. A number of babies could be saved in this way. Another three or four weeks might make all the difference between a sickly premature baby with a limited chance of survival and a reasonably healthy baby. But expectant treatment of a patient suspected of suffering from *placenta prævia* in the home or even in a poorly equipped hospital, perhaps examined at the first hæmorrhage (even though this was not serious), was another matter. The early admission of such a patient to hospital was an absolute necessity, and Dr. Saltau thought that this point could not be too strongly stressed. One never knew when this mild hæmorrhage might become serious and the patient's life might be endangered. Some temporary expedient such as packing might have to be employed under favourable conditions, and this, too, might increase the risks of subsequent treatment. So he thought that the practitioner who elected to watch at home a patient possibly suffering from *placenta prævia* undertook a very serious responsibility. In the last edition of De Lee and Greenhill's "Principles and Practice of Obstetrics", the statement was made that if a woman refused to go to hospital, the medical attendant had better drop the case and let the patient employ a physician in whom the gambling instinct was better developed. In the same way, the hazards of making a vaginal examination before the patient was sent to hospital were stressed. It was an extremely foolhardy procedure unless one was prepared, and had the equipment handy, to carry out treatment in the event of profuse hæmorrhage occurring.

Dr. Saltau said that at the Women's Hospital they did not often resort to vaginal plugging, and it now seemed to be generally accepted that the tampon should be used with great reservation. Whitridge Williams considered that the pack should be restricted as far as possible and should be regarded merely as a temporary expedient, partly because it might give rise to a false sense of security, but particularly on account of the danger of infection. It was surprising to read, in "The Queen Charlotte's Text-Book of Obstetrics", of the extent to which plugging of the vagina had been resorted to at that hospital. This was prior to 1933, but as recently as 1945 at a meeting of the Section of Obstetrics of the Royal Society of Medicine from which Dr. Saltau had previously quoted, it was stated that in 59 of 143 cases of *placenta prævia* plugging was carried out in conjunction with rupture of the membranes. It was noticed, too, that the only two maternal deaths occurred after this treatment. When the membranes were ruptured as a preliminary to plugging, his own impression was that the hazards of sepsis were increased. As he had pointed out before, sepsis had not the same terrors nowadays as previously; but he thought the aim should still be to minimize the risks of infection as much as possible. At the same meeting Dr. Leonard Phillips expressed his opinion that in future he would perform less plugging and more Cæsarean sections. Dr. Saltau thought that packing should be reserved for some of those early

cases, at about thirty to thirty-two weeks of pregnancy, in which amount of the hemorrhage warranted interference, and in which the cervix was closed, so that accurate diagnosis and other operative interference were prevented. Packing might be indicated also as an emergency treatment to enable the patient to be taken into hospital, and even if this had to be done in unfavourable circumstances, it was far better to take the risk of infection than to allow a patient to die of hemorrhage. It might be necessary, and had been necessary on odd occasions at the hospital, when hemorrhage had been profuse, to pack a vagina to allow a patient to be transported to the operating theatre in reasonably good condition for Caesarean section. Packing of the vagina in any case of ante-partum hemorrhage should be carried out properly, and if this was done there should not be much danger of converting an external into an internal hemorrhage—a danger about which apprehension was expressed in De Lee and Greenhill's book. Ideally, the patient should be anesthetized and large swabs soaked in some suitable antiseptic should be packed tightly round the vaginal fornices, larger swabs being used as the vulva was approached with a supplementary vulval pad and tight T bandage and abdominal binder. Gauze could be used, but was more irritating to the vagina. If packing was carried out in the hope that the cervix would ultimately dilate to permit further treatment, the packing should be removed in eight to ten hours and if necessary replaced.

Dr. Saltau said that he considered simple rupture of the membranes as a treatment in itself, unless the patient was in labour, to have very little scope in the management of hemorrhage in *placenta prævia*. The act of rupturing the membranes in the patient who was having a hemorrhage and was not in labour was a most unreliable method of controlling hemorrhage even in the lateral type of *placenta prævia*. If the patient should come quickly into labour, then all might be well, as the presenting part might be forced down onto the placenta; but if she did not come into labour, then one would have to supplement the treatment by packing, by version if possible, or by the application of a Willett's clamp. The tight abdominal binder and even two or three small doses of pituitrin, possibly three or four minims, might help. It was interesting to mention here that Greenhill, in "The 1944 Year Book of Obstetrics and Gynecology", expressed objection to the use of pituitrin in cases of *placenta prævia* on account of the risk of damage to the soft vascular lower segment and cervix by the stimulation of strong contractions in the uterus. Dr. Saltau did not see any objection to the giving of minute doses of pituitary extract when contractions were not present or were extremely feeble. The one definite indication for rupturing the membranes was the occurrence of strong contractions, particularly in a *multipara*. Such a patient was having sufficient hemorrhage to indicate intervention, and on examination one found the cervix perhaps one-quarter to one-half dilated, and a marginal or a lateral *placenta prævia*. After rupture of the membranes the presenting part settled down and compressed the bleeding site. Unfortunately this favourable type did not often present itself, as severe blood loss was more likely to occur earlier in labour, or when the patient was not in labour; but when a case of this sort did occur, the prognosis for mother and child should be favourable.

Dr. Saltau went on to say that the use of the hydrostatic bag had never found favour at the Women's Hospital. The use of the Champetier de Ribes bag or its modifications had been described by Playfair in 1893. It had been extensively used by Americans until recently, but now appeared to be losing favour. In the latest textbook by De Lee and Greenhill a most elaborately illustrated technique for introduction of the bag was described. It was maintained that it was applicable to all stages of cervical dilatation before the os was sufficiently open to permit delivery, and that with the bag one could dilate the cervix sufficiently for the performance of version. In the *American Journal of Obstetrics and Gynecology* for October, 1943, Watson and Gusberg, in a series of 76 cases of *placenta prævia* at the Sloane Hospital for Women, New York City, endeavoured to study the trend of treatment in the graver forms of *placenta prævia* towards Caesarean section, and to ascertain the reason for the pronounced diminution in the use of the hydrostatic bag. They showed that the "bagging", as it was called by the Americans, resulted in a greater incidence of shock and hemorrhage and more morbidity than did Caesarean section. They found "bagging", both extraovular and intraovular—both before and after rupture of the membranes—successful in controlling hemorrhage and initiating satisfactory labour in only 19.2% of cases. Hemorrhage frequently recurred when the bag was expelled with the cervix still incompletely

dilated. Although they did not urge Caesarean section as a universal treatment for *placenta prævia*, they found that the patients with severe hemorrhage and shock on admission to hospital responded better to abdominal delivery after blood transfusion and supportive treatment. Dr. Saltau thought that that summed up the position and justified the attitude adopted at the Women's Hospital, Melbourne, of relegating the bag to the obsolete. The great objection seemed to be the uncertainty as to how promptly or how slowly the bag would be expelled. Further, profuse hemorrhage might necessitate quick internal version with the resultant additional shock to the mother. This added to the gravity of the mother's condition, and there was no improvement in the outlook for the baby.

Dr. Saltau further said that in 1925 Willett had devised a new method of creating compression of the placental site and facilitating delivery. He applied a specially designed forceps to the fetal scalp. In this case compression was exerted by the fetal head itself. A small weight could be attached to the handle if necessary; but this increased the risk of the forceps's pulling off, and if the patient was in labour, all that might be necessary was to exert an occasional intermittent pull on the handle of the forceps. This method of treatment, although it had been given a good trial at the hospital when first introduced, had not been used so much in recent years. Sometimes the forceps was a little difficult to apply and occasionally it pulled off. It had been used in cases of central *placenta prævia*, but as this involved making a hole in the placenta, the prognosis for the baby was not improved. However, Dr. Saltau thought it had its uses in the lateral type of *placenta prævia* when hemorrhage was not so likely to be profuse. If vaginal delivery was to be employed, it certainly gave the baby a much better chance of survival than if the leg was brought down.

With regard to Braxton Hicks or bipolar version, first introduced by Braxton Hicks in 1864, Dr. Saltau recalled that during his term as medical superintendent of the hospital from 1924 to 1926, version was the treatment of choice in cases of *placenta prævia*. There was no doubt that from the point of view of control of hemorrhage, the plugging of the placental site by the half-breech of the child was a most effective method. When the foot was brought outside the vulva and attached to a small weight, about two pounds, further hemorrhage was completely controlled. The sad feature about bipolar version, especially when performed in the last weeks of pregnancy, was the sacrifice of babies; one could safely say that a live baby was a rarity. If a preliminary external version was performed and the breech brought over the brim, then much less manipulation was needed to bring the foot through the cervix, and the prognosis for the baby was a little better. Bipolar version was not always an easy procedure, and Dr. Saltau had found more difficulty with a small baby (at about thirty to thirty-two weeks) than with one nearer term. Some degree of shock was associated with the procedure, especially when the patient was exsanguinated. Then, too, when bipolar version was employed in cases of central *placenta prævia*, one had to make a hole in the placenta, either with the finger (which meant extensive separation and further hemorrhage, partly controlled, however, by the whole hand in the vagina), or else with some convenient instrument such as a pair of uterine packing forceps. One of the requisites for the performance of bipolar version was a cervix dilated to admit two fingers. Occasionally difficulty might be encountered in bringing the foot through the cervix along with the finger. A useful procedure was to withdraw the finger and seize the foot with a tenaculum or volsellum and manipulate it through. What were the indications for bipolar version? One might resort to it in the early cases of *placenta prævia* subsequent to packing of the vagina, to ensure if possible some dilatation of the cervix, and occasionally when the patient was in labour and bleeding profusely from a marginal or lateral *placenta prævia*, particularly if the baby was dead.

Dr. Saltau went on to say that internal version might be indicated subsequent to the rare use of packing, provided sufficient cervical dilatation was present. Occasionally in the lateral or even marginal variety one might find the cervix dilated to a half or more. This type of patient was probably having good contractions and internal version might be considered; but as he had said before, Dr. Saltau thought that rupture of the membranes and the application of a binder were more appropriate in such a case. If internal version was performed, the temptation to save the baby by extracting it through an incompletely dilated cervix must be resisted. This extraction would constitute a form of *accouchement forcé*, which all would agree was a fool-



hardy procedure in cases of *placenta prævia*. Such a rapid extraction induced shock and added to the gravity of the condition. Dr. Saltau had vivid recollections of such a case a good many years earlier, when he had seen a quick extraction through a cervix incompletely dilated of a child presenting by the breech, and the mother had died a few minutes after delivery. In these circumstances he would stress the importance of being content to bring the leg down and let the mother do the rest. In the meantime she could be given a blood transfusion if necessary.

Dr. Saltau thought that Dr. Lemmon's figures would probably show to what degree Cæsarean section as a method of treatment of *placenta prævia* had replaced other measures. He thought that this fact in part accounted for the reduced mortality rate over the last few years; but some of the credit had to be given to the improved technique and speed with which blood transfusions could be given. There was no question that the prognosis for the baby was improved, as compared with vaginal methods of delivery, when Cæsarean section was performed within the last six weeks of pregnancy. They still had to contend with the problem of the premature baby and the resultant neo-natal mortality. Then, too, they had their disappointments even when the baby, possibly weighing up to six pounds, should have had a reasonable chance of survival. One occasionally found the baby rather difficult to resuscitate after delivery, and even after successful resuscitation sometimes early neo-natal death occurred. Possibly the secondary anaemia produced in the baby by the exsanguination of the mother was a factor in these cases. Dr. Saltau sometimes thought an early estimation of the hæmoglobin value and if necessary a blood transfusion might prove valuable for these newly born babies from mothers who had had *placenta prævia*. Still, he did not think that the fact that improved figures over recent years could be shown was an indication for indiscriminate Cæsarean section. One must choose the cases with care. The interests of the mother, for example, with a true central type of *placenta prævia* were best served by Cæsarean section regardless of the baby, and Greenhill went so far as to say that in this variety of *placenta prævia* it should be performed even if the baby was dead or deformed. Dr. Leonard Phillips at the meeting in November, 1945, from which Dr. Saltau had previously quoted, also made the statement that all patients with central *placenta prævia* should be so treated. Dr. Saltau had been a little hesitant to perform Cæsarean section even in the rarer early cases of central *placenta prævia*, at about thirty to thirty-two weeks, in which the baby's chance of survival was hopeless, and preferred to carry out packing or to perform version if possible. Again, in the case of the elderly *primipara*, the interests of the baby might take first place, as the mother's prospects of further child-bearing were limited.

Dr. Saltau then discussed the indications for Cæsarean section in *placenta prævia*. He said that all patients with the central variety should be subjected to Cæsarean section, with the possible exception (as before mentioned) of the patients in very early pregnancy, who fortunately were rarely encountered. He included all elderly *primigravida* regardless of the type of *placenta prævia*, even of lateral *placenta prævia*, because the baby was all-important. To those might be added the younger *primigravida* who had been married for some years before becoming pregnant, provided the fetus was of reasonable age. He included also those patients, occasionally seen, in whom the ante-partum hæmorrhage was complicated by toxæmia or possibly by a contracted pelvis. Having decided that Cæsarean section was indicated, one had to decide the type of operation to employ. Greenhill, among the Americans, was a keen advocate of the lower segment type, and Marshall, of Liverpool, in his excellent little book on lower segment Cæsarean section, was also keen on it. Whilst Dr. Saltau admitted that the lower segment operation probably provided a more comfortable convalescence and the scar might be sounder than after other types, he had not yet been persuaded to employ it in *placenta prævia*. He still preferred the old classical operation. It had to be remembered that some of these patients were exsanguinated and gravely ill, and as the operation was a life-saving procedure, the quicker it was, the better. The greater technical difficulties of a lower segment operation, increased in these cases by the presence of the placenta, added to the time taken over the operation. Certainly the placenta was encountered on the anterior wall in about 40% of cases when the classical operation was performed, but in most of these cases the patient was in good condition and could withstand the extra blood loss involved. The aim in any case of *placenta prævia* should always be to avoid further blood loss, and Dr. Saltau thought that the classical operation was more likely to attain

this aim. One argument advanced by the advocates of lower segment Cæsarean section was that bleeding points in the placental site could be visualized and if necessary sutured. Possibly he had been fortunate; but he could not recall severe post-partum hæmorrhage following a classical Cæsarean section for *placenta prævia*. Whatever the method of treatment employed, the possibility of post-partum hæmorrhage had to be remembered, and early treatment for this condition might have to be carried out.

In conclusion, Dr. Saltau said that although the results at the Women's Hospital in recent years had been reasonably good as compared with others, he thought that the aim should be still further improvement. To attain this he once again reiterated his plea for the early admission to hospital of these patients, and the avoidance if possible of prior examination and manipulation.

#### Prognosis.

DR. W. M. LEMMON discussed the prognosis of *placenta prævia*, and referred to incidence and results. Dr. Lemmon said that, while he fully admitted the fact that statistics could often be made to prove almost anything, particularly if "corrections" were inserted, the incidence of *placenta prævia* was so small that it was only by collecting a large number of cases that conclusions could reasonably be drawn. The average obstetrician saw only a few cases of the condition each year, and the general practitioner, if he was lucky, might go for some years without seeing a case. If conclusions were drawn from such limited experience, they could only be impressions, and then they were notoriously untrustworthy. Dr. Lemmon said that the statistics which were about to be presented covered all cases of *placenta prævia* at the Women's Hospital for the ten-year period from 1934 to 1944, a total of 286 cases (Table I). In this

TABLE I.<sup>1</sup>

| Year.     | Cases. | Maternal Deaths. | Fetal Deaths. | Transfusions. |
|-----------|--------|------------------|---------------|---------------|
| 1934-1935 | 18     | 1                | 6             | 3             |
| 1935-1936 | 29     | 2                | 10            | 5             |
| 1936-1937 | 26     | 2                | 12            | 6             |
| 1937-1938 | 35     | 0                | 11            | 3             |
| 1938-1939 | 24     | 2                | 9             | 4             |
| 1939-1940 | 32     | 0                | 16            | 8             |
| 1940-1941 | 20     | 0                | 8             | 6             |
| 1941-1942 | 27     | 1                | 13            | 10            |
| 1942-1943 | 41     | 0                | 18            | 10            |
| 1943-1944 | 34     | 2                | 9             | 11            |
| Total ..  | 286    | 10               | 112           | 66            |

<sup>1</sup> Maternal mortality rate, 3.49%; fetal and neo-natal mortality rate, 39.1%.

series there were ten maternal deaths, and 112 infants were stillborn or died before the mother was discharged from hospital. The mortality rates throughout were actual, no "corrections" of any description having been introduced. Study of Table I showed a fairly uniform incidence throughout the whole period, the lowest number being 18 in 1934-1935 and the highest 41 in 1942-1943. The overall maternal mortality rate was 3.49% and the fetal mortality rate 39.1%. Although the series was small, the results compared favourably with those collected by Brown from eleven teaching hospitals in Great Britain, where the mortality rates were 5.9% and 54.2% respectively. In Comyns Berkeley's huge series the mortality rates were 7% and 59%; but in a recent series of 174 cases published by Macafee from Belfast the rates were 0.57% and 23.5%. Table II showed the incidence of the various types of *placenta prævia*—central in 90 cases, marginal in 97 and lateral in 99. In the central variety the maternal mortality rate was 6.7% (six cases) and the fetal mortality rate 42.2% (38 cases), the corresponding figures in Browne's series being 11.8% and 52.2%. In the marginal variety, the respective figures were 3.1% (three cases) and 49.5% (48 cases), while in the lateral type the figures were 1.01% (one case) and 26.3% (26 cases). If the last two varieties were grouped as incomplete, the maternal mortality rate was 2.08% and the fetal mortality rate was 38.3%, the corresponding figures in Browne's series being 4.4% and 60%.

Dr. Lemmon went on to discuss the causes of maternal death (Table III). He said that there were four cases of death from hæmorrhage, two of which were cases of post-partum hæmorrhage, and two patients who died undelivered,

TABLE II.  
Types of Placenta Prævia and Maternal and Fetal Mortality.

| Maternal Deaths.      | Central.  | Marginal.  | Lateral.   |
|-----------------------|---|--|--|
| 1934-1935 .. ..       | 1 Bipolar version; streptococcal septicaemia.   | 2 (i) Artificial rupture of membranes; manual removal of placenta; post-partum hæmorrhage; died two and a half hours after delivery.<br>(ii) Artificial rupture of membranes; died of hæmorrhage, undelivered. |  |
| 1935-1936 .. ..       |   |  |  |
| 1936-1937 .. ..       | 2 (i) Bipolar version; transfusion reaction with typical lesions in the kidney at autopsy.<br>(ii) Packing and bipolar version; post-partum hæmorrhage. |  |  |
| 1938-1939 .. ..       | 1 Classical Cæsarean section, with hysterectomy; general peritonitis.   | 1 Classical Cæsarean section with appendicectomy; <i>primigravida</i> ; died half an hour after delivery, cause not known; autopsy at morgue.  |  |
| 1941-1942 .. ..       | 1 Classical Cæsarean section; eclampsia.  |  |  |
| 1943-1944 .. ..       | 1 Vaginal packing; severe hæmorrhage after vaginal examination; packing controlled this, but patient did not rally.                                     |  | 1 Expectant treatment; forceps delivery; transfusion reaction with typical lesions in kidneys. |
| Total .. ..           | 6 (6.7%)  | 3 (3.1%)   | 1 (1.01%)  |
| Fetal mortality .. .. | 38 (42.0%)  | 48 (49.5%)   | 26 (26.3%)   |

TABLE III.  
Causes of Maternal Death.

| Condition.                        | Number of Deaths. |
|-----------------------------------|-------------------|
| Hæmorrhage .. .. .                | 4 <sup>1</sup>    |
| Sepsis .. .. .                    | 2                 |
| Transfusion reaction (kidneys) .. | 2                 |
| Eclampsia .. .. .                 | 1                 |
| Unknown .. .. .                   | 1                 |

<sup>1</sup> Two died undelivered, two died after delivery.

one of these having had a fatal hæmorrhage provoked by vaginal examination. Sepsis was responsible for two fatalities—one case of general peritonitis following Cæsarean hysterectomy for central *placenta prævia*, and one case of anaerobic streptococcal septicaemia following bipolar version for central *placenta prævia*. Two patients died of urinary suppression following blood transfusion, and characteristic lesions were found in the kidneys *post mortem*. One of these patients had had a lateral *placenta prævia* which was treated expectantly, and she was delivered by forceps when the cervix was fully dilated; the other had had a central *placenta prævia* treated by bipolar version. One of these patients was probably Rh-negative and received Rh-positive blood; but this cause of incompatibility was not known in 1936 when the death occurred. One patient with a central *placenta prævia* who was treated by classical Cæsarean section died of eclampsia, from which she was suffering at the time of delivery; and one patient with a marginal *placenta prævia* died half an hour after the rather peculiar combination of classical Cæsarean section with appendicectomy. The records did not show the cause of death, as the autopsy was performed at the morgue.

Dr. Lemmon went on to say that the incidence of the disease among *primigravida* was 53 cases (18.5%; Table IV), as compared with 20.1% in Berkeley's series with two maternal deaths (3.77%) and eighteen fetal deaths (33.9%). Table V showed an analysis of the methods of treatment employed and the results achieved and a word was necessary as to the meaning of some of the headings. Treatment had

TABLE IV.  
Incidence in *Primigravida* and Results.

| Number.    | Maternal Deaths. | Fetal Deaths. |
|------------|------------------|---------------|
| 53 (18.5%) | 2 (3.77%)        | 18 (33.9%)    |

TABLE V.  
Methods of Treatment and Results.

| Method of Treatment.                    | Number of Cases. | Maternal Deaths. | Fetal Deaths. |
|---|------------------|------------------|---------------|
| Expectant treatment .. ..               | 82               | 1 (1.2%)         | 20 (24.4%)    |
| Artificial rupture of membranes ..      | 38               | 2 (5.3%)         | 12 (31.6%)    |
| Vaginal packing .. ..                   | 6                | 1                | 3             |
| Willett's clamp .. ..                   | 18               | 0                | 12 (66.7%)    |
| Bipolar version and modifications .. .. | 34               | 3 (8.8%)         | 31 (91.2%)    |
| Internal version and extraction ..      | 7                | 0                | 6 (85.9%)     |
| Cæsarean section .. ..                  | 99               | 2 (2.02%)        | 27 (27.1%)    |
| 1. Classical .. ..                      | 76               | 2 (2.6%)         | 23 (30.3%)    |
| 2. Lower segment .. ..                  | 23               | 0                | 4 (17.4%)     |
| With hysterectomy .. ..                 | 2                | 1                | 1             |

been regarded as expectant when there had been no local treatment directed to the control of the hæmorrhage, and cases of delivery by forceps when the cervix was fully dilated were included. Under the heading of bipolar version had also been included cases of external version followed by the bringing down of a leg, and cases of breech presentation in which a leg had been brought down. Of the seven cases of internal version and extraction, five were included for associated presentation or prolapse of the cord, but only one baby survived this method of treatment.

Dr. Lemmon pointed out that it was at once apparent that the best results were obtained by expectant treatment—1.2% maternal mortality rate and 24.4% fetal mortality rate. The reason for this was not far to seek, as most of the cases in which expectant treatment was satisfactory were of the lateral variety, in which the condition was least serious, and maternal and fetal mortality rates would be expected to be less than in the more severe grades. The series of eighteen patients treated by Willett's clamp with no maternal deaths was too small for one to draw conclusions; but the fetal mortality rate of 66.7% was fairly high. It would appear that the clamp had been used mainly in those cases in which hæmorrhage continued after artificial rupture of the membranes, and it was comforting to know that there was this auxiliary method of controlling hæmorrhage if artificial rupture of the membranes failed to do so. Results comparable to those obtained by expectant treatment were obtained by Cæsarean section—99 cases with two maternal deaths (2.02%) and 27 fetal deaths (27.1%). To these figures he had been able to add thirteen more Cæsarean sections performed in 1944-1945 with no maternal deaths and three fetal deaths. If these were included the maternal mortality rate was reduced to 1.79% and the fetal mortality rate to 26.8% in 112 consecutive cases. When it was considered that in most of these cases the *placenta prævia*

was of the central variety and in some it was of the more severe grades of the marginal type, it was clear that Caesarean section, first advocated by Lawson Tait in 1890 and referred to by leading obstetricians of that period as "the last resource of a great surgeon who had forgotten his obstetrical training", had found its rightful place as the best method of treatment for all the more severe grades of the condition. Vaginal packing had been used only six times in the ten years with one maternal death and three foetal deaths, whereas in 1924 in eight cases out of twenty-six packing was used. The results of this method of treatment were not satisfactory; even the Queen Charlotte Hospital series of 99 cases with five deaths (5.05%) was not impressive statistically. The results were even worse if this method was used in domiciliary practice and in no case should packing be done prior to the patient's transfer to hospital. Morphine and an abdominal binder would do all that an inadequate vaginal pack would do and would not prejudice future treatment. Bipolar version or one of its modifications was used in 34 cases with three maternal deaths and 31 foetal deaths. The foetal mortality resulting from the use of this method was appalling and the maternal results in this series were far from satisfactory; but if Caesarean section was impossible it was the only reasonably safe alternative for the mother in the more severe grades of *placenta prævia*. To illustrate what could be achieved by the method in the hands of a person thoroughly familiar with the technique, one might cite the results of Stratz published in 1915 before blood transfusion was a common procedure. Stratz himself treated 110 patients by this method with a maternal mortality rate of 0.9% and a foetal mortality rate of 64%. The small series of 38 cases of artificial rupture of the membranes showed a surprisingly high maternal mortality rate—two deaths (5.3%), which was much higher than that in Browne's series (2.1%) and Berkeley's (1.2%).

Dr. Lemmon said that it had been thought that some information of value might be brought to light if the figures he had given were divided into two five-year series; Table VI showed the mortality rates of the two series. The maternal mortality in the later series was much reduced—1.9% compared with 5.3%; but the foetal mortality rate was worse—41.5% compared with 36.36%. Table VII illustrated the percentage of patients treated by each of the methods, and there were four points to be noted: (i) the increased popularity of artificial rupture of the membranes; (ii) the continued reduction of the number of

cases in which vaginal packing was employed; (iii) similar reduction in the number of patients treated by bipolar version; (iv) the increasing use of blood transfusion.

Dr. Lemmon then discussed the conclusions to be drawn from these statistics. He said that in the first place it seemed that the maternal mortality rate was three times as high in central *placenta prævia* (6.7%) as in the incomplete varieties (2.04%). This was only natural, as in the central varieties the hæmorrhage tended to be more profuse and less easily controlled. Furthermore, the hæmorrhage provoked by a vaginal examination made to arrive at a diagnosis might be severe and difficult to treat, particularly if the examination was made in the patient's home. Therefore it was generally agreed that it was better to transfer a patient to hospital as a "suspected *placenta prævia*" and have her arrive in good condition than to send her in an exsanguinated state due to hæmorrhage provoked by the vaginal examination made to confirm the suspicions. The second conclusion was that the foetal mortality rate was highest in the marginal variety—49.5%, as compared with 42.2% in the central variety and 26.3% in the lateral variety. This conclusion was supported by the figures as in Macafee's recent series. It was clear that many of these patients were still treated by vaginal methods, and the resultant compression of the placental site was the cause of the high foetal death rate. In the lateral varieties, which were also usually treated vaginally, the amount of placenta subjected to compression was less, so that the foetal results were correspondingly better, whereas in the central variety the treatment was usually Caesarean section. Even when the patients were treated by Caesarean section, the foetal mortality rate in central *placenta prævia* was high; but as Browne pointed out, there was a certain inescapable mortality in these cases due to two factors—(a) the amount of placental separation before treatment was begun, (b) the prematurity of the fœtus—and he placed this inescapable mortality at 25%. Dr. Lemmon went on to say that the third conclusion was that the best results in *placenta prævia* were obtained by the methods in which vaginal manipulations were minimal or absent—expectant treatment, artificial rupture of the membranes or Caesarean section. This simplification of the methods recommended for the treatment of this condition was not new, as seven years earlier there had been a fairly general feeling in Great Britain that only two methods should be used—artificial rupture of the membranes and Caesarean section—and that if the former method failed to control the hæmorrhage it was an indication that the obstetrician had chosen the wrong one. It was apparent that the choice of the method to suit the particular case was the crucial point, and it was when artificial rupture of the membranes had been wrongly chosen that the use of Willett's forceps might prove to be a useful method of saving the obstetrician's face. If the conclusion was justified that any extensive vaginal manipulation was harmful, and the statistics certainly seemed to support it, then it was clear that many cases of marginal *placenta prævia* previously considered suitable for vaginal delivery must now be regarded as cases in which Caesarean section was the best method of treatment. Dr. Lemmon then pointed out that the more general use of Caesarean section in the treatment of *placenta prævia* raised the question of what type of Caesarean operation should be used—the classical or the lower segment operation. In the ten-year figures under review there were 76 classical operations and 23 lower segment operations; but in the year 1944-1945 there were seven classical operations and six lower segment operations. This brought the total number of lower segment operations to twenty-nine, with no maternal deaths, and four foetal deaths, and although the series was small, the results to date appeared to justify its increasing popularity. The lower segment operation was also strongly advocated by Marshall, by Macafee and by Greenhill, and when the placenta was on the posterior wall the operation was no more difficult than a lower segment section for any other condition. When the placenta was on the anterior wall, however, the difficulties were undoubtedly increased, but not to an extent to deter the experienced operator, and Macafee had suggested certain improvements in technique which should be of help in such a case (*The Journal of Obstetrics and Gynecology of the British Empire*, August, 1945, page 313). It was thought, therefore, that in spite of its greater technical difficulty, lower segment Caesarean section should be regarded as the operation of choice in *placenta prævia*. The fifth conclusion was that the more frequent use of blood transfusion as a preliminary to treatment in any case of *placenta prævia* in which a severe hæmorrhage had occurred, was undoubtedly the main factor in causing the improvement in the results. The increased incidence was shown in Table VII and the

TABLE VI.

Comparison of Results in the Period from 1934 to 1939 with Those in the Period from 1939 to 1944.

| Period.            | Number of Cases. | Maternal Deaths. | Foetal Deaths. |
|--------------------|------------------|------------------|----------------|
| 1934 to 1939 .. .. | 132              | 7 (5.3%)         | 48 (36.36%)    |
| 1939 to 1944 .. .. | 154              | 3 (1.9%)         | 64 (41.5%)     |

TABLE VII.

Comparison of Methods of Treatment in the Period from 1934 to 1939 with Those in the Period from 1939 to 1944.

| Method of Treatment.                      | 1934 to 1939.<br>(132 Cases.) |             | 1939 to 1944.<br>(154 Cases.) |             |
|---|-------------------------------|-------------|-------------------------------|-------------|
|   | Number of Cases.              | Percentage. | Number of Cases.              | Percentage. |
| Expectant treatment                       | 43                            | 32.6        | 39                            | 25.3        |
| Artificial rupture of the membranes .. .. | 13                            | 9.9         | 25                            | 16.2        |
| Vaginal packing .. ..                     | 4                             | 3.03        | 2                             | 1.3         |
| Willett's clamp .. ..                     | 7                             | 5.4         | 11                            | 7.1         |
| Bipolar version and modifications .. ..   | 19                            | 14.4        | 15                            | 9.7         |
| Internal version and extraction .. ..     | 1                             | 0.76        | 6                             | 3.9         |
| Classical Caesarean section .. ..         | 31                            | 23.4        | 45                            | 29.2        |
| Lower segment Caesarean section .. ..     | 12                            | 9.1         | 11                            | 7.1         |
| Caesarean section with hysterectomy .. .. | 2                             | 1.5         | 0                             | —           |
| Blood transfusion .. ..                   | 21                            | 15.9        | 45                            | 29.3        |



diminished maternal mortality in Table VI; but it must be admitted that two of the ten deaths were directly due to transfusion accidents. These deaths should now be avoidable, provided that a hospital had an adequate transfusion team advised by an expert in these matters, and did not leave in the hands of the harassed and over-worked resident medical staff what was probably the most important single factor in the reduction of maternal mortality in this condition.

#### Radiology in Placenta Prævia.

DR. COLIN MACDONALD said that three radiological techniques were employed in endeavouring to locate the placental site as a help in the diagnosis of *placenta prævia*. The first was examination of "straight" or ordinary films. Fundamentally, all radiological diagnosis rested on a study of varying radiographic contrasts, or the comparative photographic densities of the shadows produced on the X-ray film. For example, one saw the outlines of bones clearly on the film, because they, being rich in the X-ray absorbing calcium, were surrounded by relatively radiotranslucent soft tissues. When the contrast of adjacent structures was not sufficient to differentiate their outlines, that contrast was heightened by filling cavities of organs with material of such a chemical composition that it cast a dense radiographic shadow—for example, barium in the stomach or colon, lipiodol in the bronchi. Excretion pyelography or cholecystography, with excretion of a radio-opaque dye into the cavity of a viscus, was an extension of this idea. Because of the slight difference in radiographic density between the maternal abdominal wall, the uterine wall, the placental tissue, amniotic fluid and fetal soft tissues, it was not always easy to differentiate these structures on the ordinary or "straight" films even with the use of all devices to give maximum soft-tissue contrast, such as low voltages, a relatively high speed of exposure, the rotating anode tube and plastic filters, or the use of no filters at all. In viewing these films, a powerful localized illumination directed to the anterior aspect of the film was often necessary to see the shadows of the uterine wall and placenta. Because of this, no satisfactory reproductions of these appearances could be made on slides for projection on a screen. The placental site was visualized much more often on the lateral than on the postero-anterior films, as a roughly sickle-shaped soft-tissue thickening, merging into the uterine wall and reaching an average width of six centimetres at its middle portion. It occupied from one-third to one-quarter of the circumference of the uterine wall, and in most instances, of course, was located anteriorly or posteriorly in the upper half of the uterus. Dr. Macdonald's experience had been that only in the last month or two was this soft-tissue placental shadow visualized with any conviction. Any movement of the patient or fetus was fatal to the satisfactory demarcation of various soft-tissue shadows. He had found difficulty in demarcating the placental shadow when it lay in the lower uterine segment; straight films rarely gave any direct evidence of *placenta prævia*; even when the placenta was lying normally at the fundus, it was frequently not possible to dogmatize on its presence there. It had to be mentioned, too, that the placental site was rarely visualized when hydramnios or twin pregnancy was present, or when the patient was very obese. In any portion of the body there could be uncertainty about the significance of purely soft-tissue shadows, and the placenta was no exception. Recently Chassar Moir, Nuffield Professor of Obstetrics in the University of Oxford, by experimental X-ray work on the relative densities of placenta and amniotic fluid, had come to the conclusion that the uterine and placental soft-tissue appearances (accepted in many American quarters as quite characteristic) were not always what they seemed, and he emphasized the caution that was necessary in interpretation. Additional information to be looked for in the "straight" films was provided when the presentation was by the vertex and the head was beginning to engage. It related to the distance between the fetal head and the sacral promontory on the one hand, and the distance between the fetal head and the *symphysis pubis* on the other. In cases of normal posterior implantation, but no *placenta prævia*, the promontory-fetal-head distance was usually 1.5 to 2.0 centimetres; but in low implantation or marginal *placenta prævia*, this distance was increased to about 3.0 centimetres. In anterior implantation, the symphysis-head distance was about 3.0 centimetres, but with low implantation and marginal *placenta prævia*, it was half as much again.

Dr. Macdonald went on to say that the second method of examination was used in those cases in which the "soft-tissue" X-ray appearances failed to reveal the placenta, or suggested that it lay in the lower uterine segment, or when these

X-ray appearances were equivocal. Essentially, the method employed cystography, which was the filling of the bladder with radio-opaque sodium iodide solution, and the purpose of the films was to demonstrate an increase in the thickness of that soft-tissue space lying between the presenting part and the bladder filled with sodium iodide solution. Some preferred to fill the bladder with air, rather than with sodium iodide solution. The most reliable findings resulted when the head presented and was well engaged—in other words, when term was approaching. The space between the head and the upper surface of the bladder was known as the "cephalo-vesical" space. Normally, this space was occupied by the radiotranslucent soft-tissue shadows of the bladder wall, by the peritoneal reflections between the bladder and the uterus, by the lower uterine segment, and by the fetal scalp; normally, this "cephalo-vesical" space was one to two centimetres thick. In central *placenta prævia*, interposition of the placental mass might increase the distance to five or six centimetres; in marginal *placenta prævia* there was unilateral widening of this space anteriorly, posteriorly or laterally. An additional sign was displacement of the bladder shadow to one side or another. The amount of sodium iodide solution introduced into the bladder depended on whether or not the head was engaged. If the small quantity (25 to 40 millilitres) of sodium iodide solution was used when the head was unengaged, the bladder was only partially filled, and falsely positive appearances resulted. In such cases of non-engagement, the amount of sodium iodide solution could be increased to 125 millilitres or even to 200 millilitres without discomfort, and the fundus of the bladder then moulded against the presenting part, thus giving a truer representation of the "cephalo-vesical" width.

Dr. Macdonald then said that both the methods he had described were in use at the hospital. The third was mentioned only for the sake of completeness, as it was in the latest edition of Whitridge Williams's book. It was known as amniography, and had never been employed at the hospital. It consisted in producing an artificial increase in the radiographic density of the amniotic fluid, thus presenting a contrast to the placenta and fetal soft parts. Incidentally, by this method the cord had been shown, and also the sex of the fetus by the outlines of the male genitalia, but only in the rare cases in which a truly lateral film of the fetal breech had luckily been obtained. The radio-opaque fluid used was the same as that used for excretion pyelography; by means of a four-inch lumbar puncture needle, injection of forty millilitres of this dye was made through the anterior abdominal wall directly into the amniotic sac. For half an hour the patient was rocked from side to side, to distribute the dye through the amniotic fluid, and then several films were made; the dye-stained amniotic fluid gave a much denser shadow than the comparatively radiotranslucent placental or fetal soft tissues. In other words, the placenta was represented by a "filling defect" in the amniotic sac, in much the same way as a fungating carcinoma was represented by a "filling defect" in the barium-filled stomach. The claims of the originators of this method—three Americans by the names of Manees, Miller and Holly—that the procedure could be carried out without untoward effects on the fetus or on the mother, had not been borne out, and it was because of the proven tendency of the method to terminate pregnancy that its use had of latter years been generally condemned. Incidentally, it might be mentioned that amniography had shown that the fetus not only ingested and ejected amniotic fluid, but also admitted and rejected it actively in and out of the lungs by inspiratory and expiratory movements.

Dr. Macdonald said that he had not been able to substantiate American claims that by "straight" films and cystography the placental site could be localized in over 90% of cases; but, in view of the frequent difficulties of clinical diagnosis, the X-ray method could be helpful, though it was all too obvious that careful X-ray technique, careful scrutiny of the films and caution in interpretation were essential, if misleading information was not to be given to the *accoucheur*.

#### Discussion.

DR. W. J. RAWLINGS congratulated the speakers. He said that one fact which appeared in the statistics was the tendency to retained placenta and to post-partum hemorrhage. He drew attention to the dictum of Alec Bourne, who stated that it was not the amount of blood already lost, but the amount which would be lost in the subsequent vaginal delivery, which was of importance.

DR. D. F. LAWSON concluded from his experience, which coincided with the statistical analysis given by the speakers, that there were only two practical lines of treatment, either

to perform a Cesarean section, or to do nothing and leave the case to a natural vaginal delivery.

Dr. A. M. WILSON said that he was also of the opinion that too much vaginal interference was unwise, and those patients not suitable for Cesarean section were better left alone. Only for patients in labour and making progress did he favour rupture of the membranes. He considered the classification of *placenta prævia* into types was rather artificial, and from the practical point of view he thought of these patients in terms of those who bled either a little or a lot. Contrary to what Dr. Saltau had said, Dr. Wilson had seen many recurrences after the initial hæmorrhage. In his opinion there were two forms of *placenta prævia*. In one the placenta was normal except for its low situation, and it might occur in the *primigravida*. The other variety was often found in the *multigravida*; the placenta was irregular and diffuse and the condition tended to recur. There was also a tendency to morbid adhesion and retention of the placenta, which could be due to pathological processes in the endometrium. In these cases subsequent curettage might be expected to improve the state of the decidua. This pathological state of attachment of the placenta also gave the baby a bad start, with an initial mortality rate even before the hæmorrhage occurred, and this was a factor in the high fetal mortality rate in the condition.

Dr. B. M. SUTHERLAND said that he felt that he was the only person present who could talk of Champetier de Ribes bags. These bags were difficult to insert and to retain in position, and he was glad times had changed so that the severe forms of *placenta prævia* were treated by Cesarean section, relatively little being done vaginally. While Dr. Saltau had said it was better not to be too inquisitive and stir up trouble by making a vaginal examination, Dr. Sutherland believed in no half-hearted measures. To arrive at a diagnosis he had no hesitation in making a complete vaginal examination. In congratulating the speakers, he spoke of the difficulty of obtaining facts from case records. Important points which were often not mentioned were the period of gestation and the condition of the patient on her arrival at hospital. Blood transfusion in the serious cases was a major factor, apart from obstetric management, which had reduced the mortality rate. Particular care was necessary to avoid transfusion accidents, and Dr. Sutherland was of the opinion that the Women's Hospital should set an example in its treatment, and not lose its sense of proportion by relegating this important matter to a transfusion team in which the resident medical officers took little part.

## British Medical Association News.

### NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and will resume, or have resumed, civil practice as from the dates mentioned:

- Dr. Ian L. Duncan, "The Bungalow", Marius Street, Tamworth, New South Wales (June 1, 1946).
- Dr. W. P. MacCallum, "Harley", 1943, Macquarie Street, Sydney (September 18, 1946).
- Dr. K. B. Armstrong, 217, Macquarie Street, Sydney (July 8, 1946).

## Naval, Military and Air Force.

### APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 172, of September 12, 1946.

#### ROYAL AUSTRALIAN AIR FORCE.

##### Permanent Air Force: Medical Branch.

The appointment of Temporary Wing Commander E. C. Heffernan (1186) is terminated on demobilization with effect from 13th May, 1946.

#### Citizen Air Force: Medical Branch.

The appointments of the following officers are terminated on demobilization with effect from the dates indicated: Flight Lieutenant, Acting Squadron Leader H. H. Jackson (251379), 18th July, 1946, Flight Lieutenant W. M. Barrett (256051), 22nd July, 1946, (Flight Lieutenants) G. N. Barsden (297387), 24th July, 1946, S. Dimant (257632), 26th July, 1946, C. F. McCann (257631), 29th July, 1946.—(Ex. Mins. No. 225 and No. 226—Approved 4th September, 1946.)

The appointment of Temporary Squadron Leader N. L. Newman (261890) is terminated on demobilization with effect from 16th July, 1946.

The appointments of the following Temporary Flight Lieutenants are terminated on demobilization with effect from the dates indicated: N. D. Barr (263440), 18th July, 1946, L. P. Blashki (267136), 19th July, 1946, P. G. D. Prentice (277336), 23rd July, 1946.

The appointments of the following officers are terminated on demobilization with effect from the dates indicated: (Temporary Squadron Leaders) A. L. Kennett (261528), 23rd July, 1946, H. W. R. Sharp (261982), 30th July, 1946, Temporary Flight Lieutenant, Acting Squadron Leader C. L. Gibbons (263898), 2nd August, 1946, (Temporary Flight Lieutenants) J. P. Gallagher (267409), 23rd July, 1946, H. R. Harris (267518), 24th July, 1946, C. K. Hemmingsway (266936), 29th July, 1946, G. H. Cranswick (266821), R. Fruchtmann (277480), 1st August, 1946.

#### Reserve: Medical Branch.

Albert Stephen Tredinnick (264209) is appointed to a commission with the temporary rank of Flight Lieutenant with effect from 18th July, 1946.—(Ex. Min. No. 227—Approved 4th September, 1946.)

Edward Charles Heffernan (1186) is appointed to a commission with the temporary rank of Wing Commander with effect from 14th May, 1946.—(Ex. Min. No. 299—Approved 4th September, 1946.)

## The Royal Australasian College of Physicians.

### MEETING AT MELBOURNE.

AN ordinary meeting of the Royal Australasian College of Physicians will be held at Melbourne on Thursday and Friday, October 10 and 11, 1946. The programme is as follows.

#### Thursday, October 10, 1946.

- 10 a.m.—Council meeting in the council room of the Royal Australasian College of Surgeons. The admission of new members will take place at this meeting.
- 2.15 p.m.—Meeting of the general body of Fellows in the lecture hall of the Royal Australasian College of Surgeons. The presentation of medals for the Margaret Ryan and the T. F. Ryan Scholarships in Medicine will take place at the conclusion of this meeting.
- 2.45 p.m.—First scientific session in the lecture hall of the Royal Australasian College of Surgeons: "Periarteritis Nodosa and Eosinophilic Infiltration of the Lungs", Dr. Clive Flitts. "The Mechanical Basis of Posture", Professor R. Douglas Wright. "Sequelæ of Hepatitis", Dr. W. E. King (from the Clinical Research Unit, Walter and Eliza Hall Institute of Research, and Royal Melbourne Hospital).
- 8.15 p.m.—Address by Professor F. M. Burnet, M.D., Ph.D., F.R.S., in the Public Lecture Theatre, Arts School, the University of Melbourne: "Epidemiology Today." This will be the inaugural lecture of the Professor of Experimental Medicine in the University of Melbourne. The Chancellor and Council of the University extend a special invitation to members of the College and their wives to attend.

#### Friday, October 11, 1946.

- 9.30 a.m.—Continuation of council meeting.
- 10 a.m.—Clinical demonstration at Saint Vincent's Hospital. Cases will be presented by Dr. Frank Niall, Dr. John Horan and Dr. T. E. Lowe.
- 2.15 p.m.—Second scientific session in the lecture hall of the Royal Australasian College of Surgeons: "Cervical Sympathectomy in Relation to (a) Cardiac Pain, (b)

Unilateral Headache, (c) Jacksonian Epilepsy", Sir Sidney Sewell. In the subsequent discussion Professor S. Sunderland will deal with "Certain Aspects of the Anatomy and Physiology of the Cervical Sympathetic", and Mr. Hugh Trumble, F.R.C.S., F.R.A.C.S., with "Surgery in the Control of Cardiac Pain". "Pulmonary Adenomatosis", Dr. A. J. Canny. "Sulphanilamide Prophylaxis against Relapse of Rheumatic Fever in Childhood"—Preliminary Report, Dr. Lawrence Stokes.

#### Exhibits.

The following exhibits will be on view continuously throughout the course of the meeting: "Exhibition of Charts and Models Illustrating the Use of Visual Methods as an Aid to Clinical Diagnosis", Dr. Morris C. Davis. "A Pathological Demonstration Showing Various Conditions of Medical Interest", Dr. T. E. Lowe. "X-Ray Films Demonstrating Differential Diagnosis in Relation to Cardiac Aneurysm and Boeck's Sarcoidosis", Dr. Alan Mackay.

### Post-Graduate Work.

#### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

##### WEEK-END COURSE AT PARRAMATTA.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a week-end course will be held at Parramatta on Saturday and Sunday, October 19 and 20, 1946, in conjunction with the Central Western Medical Association.

The programme for the course will be as follows:

##### Saturday, October 19, 1946.

At the Parramatta District Hospital.

- 2 p.m.: Registration.  
2.30 p.m.: "A Brief Survey of the Anatomy and Physiology of the Female Pelvis, Including the Endocrines", Dr. F. A. Maguire.  
4 p.m.: "Some Endocrine Disturbances of Infancy and Childhood", Dr. Lorimer Dods.

##### Sunday, October 20, 1946.

At the Parramatta District Hospital.

- 10 a.m.: "The Story of Nephritis", Dr. T. M. Greenaway.  
11.30 a.m.: "Fluid and Nutritional Requirements of the Sick Child", Dr. Lorimer Dods.  
2 p.m.: "Hypertensive Disease", Dr. T. M. Greenaway.  
3 p.m.: "Gynaecological Plastic Operations", Dr. F. A. Maguire.

The fee for the course will be £1 1s., except for members of the defence forces, who may attend the course without fee. Those intending to be present are requested to notify Dr. K. S. Macarthur Brown, Honorary Secretary, Western Medical Association, "Brislington", 12, George Street, Parramatta, as soon as possible.

#### THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

##### COURSE FOR THE DIPLOMA OF PSYCHOLOGICAL MEDICINE, PART II.

THE Melbourne Permanent Post-Graduate Committee announces that a course has been arranged to cover the subjects for the Diploma of Psychological Medicine, Part II, and, provided at least four candidates are enrolled, will be conducted as follows:

*Neurology*, by Dr. E. Graeme Robertson, at the Royal Melbourne Hospital, on Mondays at 8.45 o'clock p.m., commencing October 14, 1946. Fee: 10 guineas.

*Neuropathology*, by Dr. L. B. Cox, at the Alfred Hospital, on Thursdays at 4.15 o'clock p.m., commencing October 17. Fee: 10 guineas.

*Psychiatry*, by Dr. J. K. Adey, at the Mental Hospital, Royal Park, on Tuesdays at 2 o'clock p.m. and Thursdays at 10 o'clock a.m., commencing October 17. Fee: 15 guineas.

Applications from those proposing to attend these classes should be forwarded to the Post-Graduate Committee's office, College of Surgeons, Spring Street, Melbourne, C.1, by September 30. Service medical officers entitled to financial assistance under the Commonwealth Rehabilitation and Training Scheme part time are requested to indicate this fact on their application. It would be appreciated if the fee for the classes could accompany the application from those not so entitled.

#### COURSE IN OBSTETRICS AT ADELAIDE.

THE Post-Graduate Committee in Medicine of the University of Adelaide announces that a week-end course in obstetrics will be held on November 9 and 10, 1946. The subject for the course will be puerperal sepsis. The fee for the course will be £3 3s. for those who have been in general practice for three years or longer and £2 2s. for others. The titles of the lectures and the names of the lecturers will be announced in the circular issued to members by the South Australian Branch of the British Medical Association or may be obtained from the medical secretary of the committee.

### Correspondence.

#### SOME PROBLEMS OF BACKACHE AND SCIATICA.

SIR: Dr. Lindon's reference (THE MEDICAL JOURNAL OF AUSTRALIA, September 7, 1946, page 345) to Kipling's "Ballad of East and West" applies so obviously to myself that one wonders if his next sentence is also meant to refer to me, namely: "So much has been written on this subject, so much of wishful thinking, so much of pious opinion unsupported by anatomical fact . . ."

Dr. Lindon should make sure of his own anatomical facts before making such statements as: "It is doubtful whether an intervertebral disk of cartilage has any pain sensibility at all." If the intervertebral disk was composed of cartilage only Dr. Lindon's doubts would be justified, but the disk is composed of fibrocartilage, nerve fibres are present in the disk,<sup>(1)</sup> they are probably pain fibres,<sup>(2)</sup> and pressure on the annulus at operation is painful.<sup>(3)(4)(5)</sup>

Dr. Lindon also states: "The concealed disk and the mobility test are, I believe, good examples of wishful thinking." The concealed disk cannot be demonstrated until one knows how to interpret the mobility test, and the concealed disk and the mobility test are not examples of wishful thinking. The test was not "coined by chiropractors", but was developed by the late Dr. W. E. Dandy, and, as a pen friend of that eminent surgeon, I take exception to Dr. Lindon's reference to chiropractors. I am sure that, if Dr. Lindon knew how to interpret the mobility test and therefore how to recognize a concealed disk, he would not have made this reference, and I would prefer him to withdraw it.

Dr. F. J. Clark and I have recorded the mobility test on a motion picture film, and we will be happy to make this film available to Dr. Lindon at any time if he so desires, and we would then hope that he would see fit to refer to Clough.

And not by eastern windows only,  
When daylight comes, comes in the light,  
In front, the sun climbs slow, how slowly,  
But westward, look, the land is bright.

Yours, etc.,

JAMES H. YOUNG.

131, Scarborough Beach Road,  
Mount Hawthorn,  
Western Australia.  
September 13, 1946.

#### References.

<sup>(1)</sup> P. G. Roafe: "Innervation of Annulus Fibrosus and Posterior Longitudinal Ligament", *Archives of Neurology and Psychiatry*, Volume XLIV, 1940, page 100.

<sup>(2)</sup> M. E. Coventry, R. K. Ghormley and J. W. Kernohan: "The Intervertebral Disc: Its Microscopic Anatomy and Pathology", *The Journal of Bone and Joint Surgery*, Volume XXVII, 1945, page 105.

<sup>(3)</sup> A. I. Josey and F. Murphey: "Ruptured Intervertebral Disk Simulating Angina Pectoris", *The Journal of the American Medical Association*, Volume CXXXI, 1946, page 581.

<sup>(4)</sup> M. A. Falconer: Personal communication to Dr. F. J. Clark.

<sup>(5)</sup> H. H. Stewart: Discussion at a meeting of the Western Australian Branch of the British Medical Association, October, 1945.



## Obituary.

C. U. ARIËNS KAPPERS.

THE following communication has been received from Professor A. N. Burkitt, Department of Anatomy, University of Sydney, and Professor A. Abbie, Department of Anatomy, University of Adelaide.

We have just received news of the death of Professor Doctor C. U. Ariëns Kappers, of Amsterdam, on July 28 of this year.

We feel that this event should not be allowed to pass unnoticed in Australia. The name of Professor Kappers will always be associated with the principle of "neurobiotaxis", which he elaborated to explain the migrations of nerve cells within, and outside, the central nervous system; but his work comprised much more than this. Moreover, a number of Australians, particularly from Sydney, have visited his "Central Institute for Brain Research" in



Amsterdam, and some, notably Hunter, Burkitt and Abbie, worked there for more or less extended periods. Hunter and Abbie did the work for their Sydney M.D. theses there. Quite apart from the unique opportunity for such work that the institute afforded, every visitor to Kappers will retain always a warm memory of the kindly welcome accorded to every serious scientist, the generosity with which material and years of learning were made available, and the all-pervading charm of the director.

For the benefit of those less familiar with this great man we are appending a brief biography which is as accurate as is possible from this distance.

Kappers was born in Groningen in about 1879. His father was a professor at the *Lycée*, successively in Meppel and Sappemeer, and later director of that at Leeuwarden. Kappers was educated mainly at the Meppel *Lycée*, and at eighteen years commenced the study of medicine at Amsterdam. While still a student he published a paper on the origin of the myelin sheath and neurilemma of peripheral nerves.

After graduation Kappers was appointed to the pathological laboratory of the surgical clinic at Amsterdam, and during this period made some observations on the post-mortem changes in cells. He took a trip to the marine biological station at Naples and acquired some insight on comparative neurology which he put to good purpose in his M.D. thesis (Amsterdam) on the central nervous system of various fishes. This included some of the first systematic observations on the hypothalamus. The thesis attracted the notice of Edinger, director of the Neurological Institute in Frankfurt-am-Main, and secured an appointment as assistant in 1904. Kappers worked with Edinger until 1909

and laid the foundation of his future work in comparative neurology; it was during this period that he first conceived the principle of neurobiotaxis.

In 1909 Kappers was unanimously selected as director of the newly established Centraal Instituut voor Hersenonderzoek in Amsterdam. There he remained until his death this year, but with some excursions to other universities, notably Pekin and Beirut. He accomplished a tremendous amount of work in his chosen field and provided an interim summary in 1921 in his "*Die vergleichende Anatomie des Nervensystems der Wirbeltiere und des Menschen*". In 1936 this was brought up to date with the assistance of G. Carl Huber and Elizabeth Caroline Crosby and republished in English as "*The Comparative Anatomy of the Nervous System of Vertebrates, including Man*". After his return from Syria Kappers turned his attention more to anthropology, being particularly interested in the evolution of the brain in primitive man, and later in the more purely craniological aspect of the subject, which he pursued with characteristic enthusiasm.

A tremendous worker himself, Kappers inspired others to similar efforts and numbered among his assistants such eminent neurologists as Van Valkenburg, de Vries, Brouwer, van der Horst and Addens. He was an accomplished linguist and published his papers in several languages. His infinite charm, hospitality and learning attracted innumerable visitors, none of whom departed without learning something new. Kappers remained a bachelor until the middle 1930's, devoting all his time and talents to his work and his institute. A man of inviolable principles, he criticized fiercely the German anti-Jewish policy after the 1914-1918 war and afforded refuge and hospitality to many homeless Jewish scientists. During the late war he maintained his scientific work as well as possible, but there can be little doubt that his pro-Jewish attitude did not help him during the German occupation. He lost over eighty pounds' weight, and this must have contributed towards his untimely death this year.

As a measure of the respect and affection in which Kappers was held by his fellow countrymen we may note that when he was offered a much better position at New Haven University his admirers in Holland succeeded in improving so much the terms of his appointment in Amsterdam that he refused the tempting bait. This, we may add, is as much a tribute to the enlightenment of the Dutch as to the qualities by which Kappers was so distinguished.

All who knew him will mourn the passing of a very great man and scientist.

ROBERT MARSHALL ALLAN.

THE Council of the Victorian Branch of the British Medical Association at a recent meeting recorded the following special minute in regard to the work of the late Professor Robert Marshall Allan.

The Council of the Victorian Branch of the British Medical Association records with profound regret the death of Robert Marshall Allan, M.C., M.D., F.R.C.S. (Ed.), F.R.A.C.S., F.A.C.S., F.R.C.O.G., who, as the first Professor of Obstetrics in the University of Melbourne, as a member of the Branch Council, and as Honorary Secretary and President of the Branch, rendered most valuable service to the medical profession and the people of Victoria. His influence on the teaching of obstetrics will remain as an enduring monument and his students and colleagues will remember him with affection.

The Council offers its sympathy to his wife and children.

HENRY PRITCHARD ELLIOT.

WE regret to announce the death of Dr. Henry Pritchard Elliot, which occurred on September 7, 1946, at Nelson Bay, New South Wales.

## Nominations and Elections.

THE undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Haselgrove, Harold Frederick, M.B., B.S., 1946 (Univ. Adelaide), 33, Stepney Street, St. Peters.

Sibthorpe, Gwentyth, M.B., B.S., 1946 (Univ. Adelaide), 30, Main Street, Henley Beach.

The undermentioned has applied for election as a member of the Tasmanian Branch of the British Medical Association: Ingram, Thomas Giles, M.B., B.S., 1942 (Univ. Melbourne), General Hospital, Leunceston.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Benedek, Stephen, provisional registration, 1946 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.  
Bennett, Winston Noel Chevalier Gerard, M.B., 1942 (Univ. Sydney), 3, Gundimaine Avenue, Neutral Bay.

Blashki, Loris Phillip, M.B., B.S., 1941 (Univ. Sydney), c.o. 56, Birriga Road, Bellevue Hill.

Campbell, Colin Alexander Kemp, provisional registration, 1946 (Univ. Sydney), 8, Beach Road, Edgecliff.  
Clarke, Bruce Gibson, M.B., B.S., 1943 (Univ. Sydney), (Captain), 15 Camp Hospital, Cowra.

Grant, Alan, provisional registration, 1946 (Univ. Sydney), 37, Fitzroy Street, Kirribilli.

Kilgour, Donald William, M.B., B.S., 1944 (Univ. Sydney), Catherine Hill Bay.

Ryan, William Patrick, M.B., 1937 (Univ. Sydney), 14, William Street, North Sydney.

Symonds, Lloyd Saul, M.B., B.S., 1945 (Univ. Sydney), 37, Oliver Road, Roseville.

Waterworth, David Henry, M.B., B.S., 1940 (Univ. Melbourne), (Captain), 113 (Concord) Military Hospital.

#### WORLD STUDENT RELIEF FUND: AN APPEAL FOR FUNDS.

An appeal for funds is being made by "World Student Relief". This is the joint product of three world bodies: International Student Service, World's Student Christian Federation and *Pax Romana*. The universities of Europe were hard hit by the world war of 1914-1918. Students from the five continents raised a sum of £830,000 for student relief. Today not only the universities of Europe have suffered, but those of Asia as well. For 1946 World Student Relief expects to gather about £500,000 for its relief programme. Australia's share of the £500,000 is put down at £3,600. The Australian Committee for World Student Relief represents the Australian Student Christian Movement, International Student Service and the University Catholic Federation of Australia. The office of the Australian committee is at 182, Collins Street, Melbourne. We commend this appeal to the members of the medical profession in Australia.

#### Books Received.

"Further Studies in Encephalography", by E. Graeme Robertson, M.D. (Melbourne), F.R.C.P., F.R.A.C.P.; 1946. Melbourne: Macmillan and Company, Limited. 10" x 7½", pp. 114, with many illustrations, some of which are in colour. Price: 45s.

"The Pre-School Child and Society: A Study of Australian Conditions and their Repercussions on National Welfare", by John Bostock and Edna Hill; 1946. Brisbane: The University of Queensland. 6" x 8½", pp. 221, with illustrations. Price: 18s.

"Agnosia, Apraxia, Aphasia: Their Value in Cerebral Localization", by J. M. Nielsen, B.S., M.D., F.A.C.P.; Second Edition; 1946. New York, London: Paul B. Hoeber, Inc. 9½" x 6½", pp. 394, with 59 illustrations. Price: \$5.00.  
"Autopsy Diagnosis and Technique", by Otto Saphir, M.D. Foreword by L. Hektoen, M.D.; Second Edition; 1946. New York, London: Paul B. Hoeber, Inc. 7½" x 5", pp. 430, with many illustrations. Price: \$5.00.

#### Medical Appointments.

Dr. Ross Hawker has been appointed Quarantine Officer, Commonwealth Department of Health, under the *Quarantine Act*, 1908-1924.

Dr. G. V. Smith has been appointed a member of the Medical Board, Port Pirie, under the provisions of the *Workmen's Compensation Act*, 1932-1944, of South Australia.

Dr. J. N. Main has been appointed senior medical officer, Division of Mental Hygiene, Department of Public Health, New South Wales.

#### Diary for the Month.

- SEPT. 21.—New South Wales Branch: Ethics Committee.  
SEPT. 25.—Victorian Branch, B.M.A.: Council Meeting.  
SEPT. 26.—New South Wales Branch, B.M.A.: Branch Meeting.  
SEPT. 27.—Queensland Branch, B.M.A.: Council Meeting.  
OCT. 1.—New South Wales Branch, B.M.A.: Council Quarterly.  
OCT. 2.—Western Australian Branch, B.M.A.: Council Meeting.  
OCT. 2.—Victorian Branch, B.M.A.: Branch Meeting.  
OCT. 3.—South Australian Branch, B.M.A.: Council Meeting.  
OCT. 4.—Queensland Branch, B.M.A.: Branch Meeting.  
OCT. 4.—New South Wales Branch, B.M.A.: Annual Meeting of Delegates.  
OCT. 8.—Tasmanian Branch, B.M.A.: Ordinary Meeting.  
OCT. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
OCT. 8.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
OCT. 11.—Queensland Branch, B.M.A.: Council Meeting.  
OCT. 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
OCT. 16.—Western Australian Branch, B.M.A.: General Meeting.  
OCT. 17.—Victorian Branch, B.M.A.: Executive Meeting.  
OCT. 17.—South Australian Branch, B.M.A.: Council Meeting.  
OCT. 22.—New South Wales Branch, B.M.A.: Ethics Committee.

#### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

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